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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

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SKETCHES OF THE HABITS AND MANNERS OF OLD TIMES IN VIRGINIA.

(Fragment of a manuscript.)

When Mr. M——— had been a few weeks at his new home, it was proposed by Mr. C——— that they should ride through the neighborhood, that M——— might see the many changes which had taken place during his long absence of twenty-five years. Accordingly they set out, on horseback, that they might follow any unfrequented path, as well as the public roads. M——— though not curious about the affairs of others, nor fond of gossip, was glad to learn the present state of things around him, and their tendencies; and C——— was well pleased to describe and descant on things, of which he had been so long a silent, yet close and accurate observer.

"First in order then," said M———, "while we are riding through my own land, the theatre of his devastations, you should tell me of my predecessor B———, of whom I know scarcely any thing, except the mischief which he has here committed, and the decay and ruin which he has permitted to take place."

"B———'s course," answered C———, "has been similar to that of thousands in Virginia, who have either gone, or are going, after running their course here, to people the new western states. His father was a miserly skin-flint, who had no earthly enjoyment except that of hoarding money, and adding to his lands. He bought, as you know, your father's land, when it was sold to satisfy the mortgage which he held. He died not many years after; and this farm was part of the large and then productive estate which was inherited by his youngest son. The old man, like many other fathers even less tainted than himself by avarice, never would give to his children any share of his property so long as he lived. He had supported them in idleness and in extravagance, and at a far greater annual cost to himself that would have been the income of a reasonable capital given among them, and judiciously managed. But he could not bear the thought of divesting himself of any part of his capital during his life; and, moreover, he feared to trust his sons with the direction of what was to be theirs in the course of time; until they were, by the consequences of his distrust, actually rendered unfit to be so trusted. Many young men, who would soon learn to be careful and economical in the management of their own property, will as certainly be wasteful of the funds of others, which they cannot use otherwise than by spending, and have no inducement, of self-interest, whatever, to economize. Old B——— continued until his death to undergo daily toil and vexation in attending to all the details of his extensive business; and thus, in labor and privation, was acting as a steward for the future enriching of sons, whom, while he lived, he kept entirely dependent, and poor, though prodigal, idle, and greedy of the father's money; and, fortunately, (as a natural consequence) anxious for his death, as the only means of getting more money than was grudgingly doled out to them for daily expenses. They engaged in no business, because of their expectations of wealth—and they were extravagant, as well as idle, because as each son could have no more than he spent, it became (as he thought) his interest to spend as much as could possibly be squeezed out of the old man's gripe. Thus were they kept as dependants and paupers—prodigal and luxurious, but not the less paupers—until, at last, death gave to them the long-expected possession of the father's large property. The two oldest sons were then between 35 and 40 years of age, and the habits contracted and nurtured during their long state of idle and expectant pauperism had quite unfitted them for increasing or preserving their late-acquired wealth. No man can give up a large portion of his life to idleness, and the mere pursuit of sensual indulgence, (which is miscalled pleasure,) without adding to the sacrifice, his morals, and his fitness to resume proper and business habits. One of these heirs lived just long enough to spend, by gaming and other pleasures, the whole of his property; and the other avoided the like result, by dying of drunkenness before the work had been half completed. Their sister had married a man who sought her hand on account of her rich expectations, and who ceased to exert himself, and labor in his previous employment, as soon as he had secured such snug quarters. The old man had given him nothing, except bed and board for himself and a rapidly growing family; and his wife having died a short time before her father, the husband received not a penny of her long-expected share, which was all secured to his children—and he was left loaded with debts, incurred on the ground of his expectations of wealth.

"Your predecessor was too young, when his father died, to have suffered materially by the length of his pauper training. And he was so disposed that he would have made a provident and thrifty farmer, if he had been sustained by enough of proper examples, or had possessed the moral courage to resist the idle and spendthrift habits of this county, and to live for his own gratification and benefit, and not for the service, or to gain the applause, of the spongers and idlers of his neighborhood. Young as you then were, Mr. M———, you knew what were then the habits of this part of the country; and which, though much improved, still are existing habits in almost every county on the tide waters. Every gentleman's home was open to every visiter who thought proper to make use of it, to enjoy the entertainer's hospitality. Many young men (whose connexions were too respectable to permit their being treated as they deserved,) had no other employment, or means of living, but by sponging; that is, they visited from house to house, wherever there was plentiful and good fare, and that appearance of welcome which hospitality accorded to them, even when they were heartily despised. These spongers, together with many other persons who, though not, like them, destitute of property or em-

ployment, yet visited almost as much for pleasure, as did the others as a matter of business, would suffice to eat up a good estate before it had passed through the hands of two generations, if it was not husbanded with more than common care. With B———, owing to his numerous acquaintances of this kind, contracted before his father's death, the work of waste went on with such unusual rapidity, that he soon saw, that, without a change, his estate would scarcely last through his own life. To a man of firmness and moral courage, the proper change and remedy would have been obvious and easy. But not so to B———. Retrench *here* he could not bear to do—though convinced that it would have saved his property, without causing scarcely any privation of comfort to his family. But he *could* do this in the western wilderness, where economy was held as meritorious, and privations were universal; and, accordingly, to the west he fled—and, (as most other emigrants from Virginia do,) not so much to get possession of rich land, and to reap great profits, as to escape from the presence of his "troops of friends" here, and and the so much lauded exercise of "old Virginia hospitality." From living here not only in the enjoyment of every comfort, but of luxury and splendor, he changed to a residence in a log-hut, scarcely securing its inmates from the violence of the wind and rain, and without the conveniences and comforts which the houses of his own slaves had possessed in Virginia. Every article of furniture, the lodging and the food, for his previously tenderly nurtured family, were coarse and mean—even to the loss of ordinary necessaries and comforts, moral as well as physical. There, on the outer borders of civilization, and far beyond the limits of refinement, and of well organized society and good government—destitute of almost every social pleasure—but freed from friends and visiters, and every temptation to idleness and expense—B——— is again becoming rich; and with half the amount of the sacrifices he has there submitted to, he might have accumulated wealth *here*, if not as fast as in the western country, at least fast enough for happiness, and to satisfy any reasonable man. He, however, is one of the fortunate class of emigrants; and the extent of his good fortune will be to leave great wealth to his children, after having debarred them from all the best means of obtaining education and instruction; not literary instruction only, but social, moral, and religious. They will be trained very differently, it is true, but scarcely better, than was done in regard to himself and the other children of his father.

"Some legal difficulties, and other circumstances, at first prevented B———'s selling this farm; and it was, therefore, rented out, to tenants for a single year. Each occupier, of course, aimed to make as much as possible for himself during his short term, and to expend as little as possible in repairs, and nothing for improvement or preservation of fertility. Of course, it did not require many years for the farm to reach the present state of dilapidation; and which, indeed, was well advanced before B——— left it."

"Those who, like B———," said M———, "thus waste the products of the earth, and destroy its fitness to produce in future time, I hold to be guilty of high crimes against society; and if I was a law-giver, like Solon or Lycurgus, these offences should certainly have their place in my penal code."

"I am afraid then that your code would be more bloody than that of Draco's; and that, in lower Virginia, there would scarcely be found so many persons clear of all such offences, as would serve to judge the cases, and to inflict the penalties on the guilty. For, injurious and destructive as may be the course pursued by B———, it is but one of many operations, by which our habits, and sometimes our laws, are continually acting to destroy the fruitfulness of the earth, and to lessen the effect of the blessings offered by our Creator to man's acceptance and use. Some examples, of a different character, will be offered to our notice during the day's excursion."

"Yonder house," said Mr. M———, "was formerly the residence of an industrious farmer, doing well, and rearing his children to habits of industry. They, at least, ought to have been prosperous, though the houses and the farm certainly do not appear to be the abode of the prosperous."

"Neither are they so. Old S——— died without a will, leaving a widow and six children, of ages from twenty-five to less than five years. His farm, when in his own hands, and well managed, as it was, had served to maintain his family in comfort, and to enable the owner every year to increase his store. But as soon as it was divided into seven shares among the widow and the six children—or rather, thirteen shares, in the end—as the widow's dower of one-third, will, at her death, have to be divided into six other shares—the land lost half its productive value, and the family sunk from a state of comfort and independence, to want. The farm was well arranged for a single property, but, for that very reason, was quite unfit to be cut up into seven, or into thirteen separate properties. Two of the children only were over twenty-one years, and therefore capable of selling their shares. They drew detached pieces, both of land entirely cleared for cultivation, and without a house, or a tree for fencing or fuel, on either share, or any means of procuring what was wanting, close by. Both were obliged to sell their shares: but of course they could get no more price than the land was worth under the then existing disadvantages; and each received about half the price that the land would have been worth to the owner of the whole farm. Nor did the new purchasers make any thing by their bargains, on account of reduced price, as the price was really high enough for the new value, as reduced by division. The like course will have to be taken by each other child, as they successively come of age; and thus it will take more than fifteen years to have the farm finally again arranged, and then as badly as it well can be, parts being attached to perhaps three or four other adjacent farms. The loss of value, total and uncompensated to any one, cannot be less than one-fourth of the whole estate. And before the new arrangement will be finished, perhaps similar new cuttings up, for division of the same land, will be going on, in consequence of the death of some one of the purchasers of the shares, and the division of their estates. Half the number of all such impoverished heirs are also seekers of wealth in the west."

"You observe the delapidated condition and cheerless appearance of the extensive and formerly excellent farm buildings. It is sufficiently explained by its being in possession in right of dower.

The widow has all the buildings, with but a third of the farm in value, and perhaps a sixth in extent, and in product. Her's is only a life estate, and obviously she has not the means to keep the buildings in repair; and if she had the means, it would not be to her interest to do so. This is also a very regular part of the system."

"Such evils as these," said M———, "must be very frequently produced to more or less extent, in the division of every farm among several heirs."

"So they are, unless it was much too large for one farm before—but seldom to such a ruinous extent, as in this case. The smaller the farm and the shares, the greater the loss to the proprietors.

"Is there no remedy, or means, to prevent such enormous losses, public as well as private?"

"A very easy and sure means would be, to direct by law the sale of every estate, both land and slaves, as well as other property, unless divided, and the distribution specially directed, by the will of the deceased proprietor. I would not interfere with the privilege of every man to injure or destroy the value of his estate by his own deliberate act; but I would not so frame laws as to do this act for him, and indeed almost compel its being done in every case."

"Well, if the loss is so great and the means of safety so easy, why are they not adopted by the legislature?"

"They have never even been proposed, and if proposed, probably would not get the support of twenty votes. It is a general feature of our code in Virginia, to take such special good care of the estates of deceased persons, that it will condemn the heirs to certain and great loss, and often probable ruin, lest they should incur a risk of loss in some other way. The law is so fearful that heirs would spend their estates, if sold, and in money, that it prefers to ruin the heirs by compelling them to hold land, that is incapable of yielding, in separate shares, half its proper product, whether by sale, rent, or tillage by the owner."

They next had a view of a large mansion house, which seemed newly repaired and painted, and the offices, farm buildings and fences in excellent order. "I knew this estate," said M———, "when its condition was much worse; indeed something approaching to that of my own at present, except that its fertility had not been near so much exhausted. What has produced a change so different from what is seen generally?"

"This farm was bought about fifteen years ago, by Mr. L———, one of the heirs among whom it was to have been divided, to prevent the loss of value that such division would have inevitably produced. A rare conjunction of favorable circumstances permitted such a purchase to be made—all the heirs being of age, and willing to sell together, and a purchaser being found rich enough, and willing to make so large a purchase. No farmer of the county, owing to the prevailing habits of waste, could have found the means to make such a purchase. Mr. L———, though born in an old and wealthy family in this country, and still regarding it as his home, was placed in early life, in a counting house in ———, where he has continued to reside, and is now in the possession of considerable wealth, gained by commerce. A towns-man and a merchant could not know much of practical agriculture; but he had sound and correct opinions as to the general value of the lands of his native county, and of the gross defects in the tillage, and still more in the economy, of the land-holders. He brought his systematic commercial habits to bear upon his farming, and though he was under the additional great disadvantage of not residing generally on his land, and of course yielding the management to an overseer, both his success and profit have been remarkable. He has been throughout as particular and exact in keeping the accounts of his farming, as of his commercial transactions—and he lately assured me that he had made a nett annual profit of eight per cent. on the whole cost of purchase, stocking, and cultivating the land."

"Is there any peculiar merit, or mode of improvement in his practice, besides industry and general attention being paid to method and economy?"

"None—unless it be this: he is abundantly cautious in testing the value of any new improvement—but when once satisfied of its being good and profitable, he pays for it to as great an extent as circumstances permit the use, without a lessening of profit. Such things, he very properly regards as the investment of capital in a stock yielding more than ordinary profits, and makes no limit to the investment as long as there is such stock to buy, and he has money to buy it. It is obvious, that to his mercantile education and habits, this course is owing, and that his large available capital enables him easily to make such investments. But still, every farmer could, to very great extent, act according to the same rule; and there are very few who do not fail even to make the attempt. Ask of all these wretched managers, whose lands we shall pass by in our day's ride, and you will learn that every one is perfectly assured that if he could "find time," or "spare money," to adopt some particular improvement to sufficient extent, that he could make a large profit, say twenty per cent. and often much more, upon the outlay. And yet all these persons are, in various ways, devoting far greater amounts of time or expense to other labors on their farms, which do not bring them 3 per cent. clear profit, if indeed, any. Now the notions of these men as to the profit of practices which they say they are not able to adopt, are, in some instances true, and in many others, perhaps, false. Nevertheless, they all fully confide in the truth of their several opinions, and ought to do as Mr. L——— would do, undertake them with as much certainty as he would sell out a six per cent. stock, for the purpose of buying in another that would yield ten per cent. on the same capital."

The next farm was very different from the last, but yet afforded equally strong evidences of comfort and a thriving condition. The dwelling house had originally contained one small room and a garret, and this had been added to, at different times, by sheds, and wings, and new apartments, some of which were longer than the original body, so that the whole formed an odd and ludicrous architectural jumble. Yet every thing showed the hand of industry and care, and that economy was consulted in every arrangement.

"In this house," said C———, "a very poor man of the name of O———, began his married life, and on the surrounding land, his unremitting labors for thirty years have been applied. His house and his clearings, his family and his money,

have all been continually growing during the whole time. Yet he has had no unusual facilities to make profit, nor exhibited any uncommon intelligence in devising or conducting his farming, or other labors. His whole means have been, to work every day, regularly, and to raise and train every child to do the like—and to spend nothing that was not necessary, or that could not be well afforded. Still his labors have never been greater than probably conduced both to pleasure and health, and his family have been in want of no necessary of life, or plain comfort, though otherwise living as cheaply as possible."

"There are few such intelligent and judicious, and wealthy improvers, of their own and the public wealth, as L——, the owner of the last farm we passed by; but there are numerous individuals of the same class, and general habits, of this poor and laborious man. And it is well that there are; for, but for the general waste and destruction of God's bounties, caused by others, being partially repaired by the humble, unostentations, (often ill-directed,) and scarcely noticed labors, of such economists as O ——, this would already have been a ruined country."

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AN OUTLINE OF THE FIRST PRINCIPLES OF HORTICULTURE; OR VEGETABLE PHYSIOLOGY, APPLICABLE TO CULTIVATION.

By John Lindley, F. R. S. &c. &c.

Professor of Botany in the University of London, and Assistant Secretary of the Horticultural Society.

Preface.

It has long been thought by intelligent men that it would tend essentially to the advancement of Horticulture, if the physiological principles, upon which its operations depend for their success, were reduced to a series of simple laws, that could be readily borne in mind by those who might not be willing to occupy themselves with the study, in detail, of the complicated phenomena of Vegetable Life.

The importance of these laws is so great, that there is not a single practice of the gardener, the farmer, or the forester, the reason of which, if it relates to the vegetable kingdom, can be understood without a knowledge of them.

It has happened, indeed, that many very interesting facts in Horticulture, Agriculture, and Arboriculture, have been discovered fortuitously; and that improvements in them still continue to be occasionally the result of accident; but it cannot be doubted that these discoveries or improvements would have been long anticipated, had the exact nature of the laws, from which they necessarily result, been earlier understood.

There can, moreover, be but little mental interest in watching the success of operations of which the reasons are unknown, compared with that which must be felt when all the phenomena attendant upon practice can be foreseen, their results anticipated, or the causes of failure exactly appreciated.

It must also be manifest, that, however skilful any person may become by mere force of habit, and by following certain prescribed rules, which experience has, or seems to have, sanctioned; yet that much more success might be expected, if he acted upon certain fixed principles, the truth of which has been well ascertained, instead of following empirical prescriptions, the reason of which he cannot understand.

It is not, however, to be understood from this last observation, that rules of cultivation are to be neglected because they cannot be physiologically explained. On the contrary, the mere fact of a given mode of culture having been followed for a length of time by persons deeply interested in the success of their operations, and of much experience, ought to give it very great authority; for it is well known that there are many important facts, the reason of which is either extremely obscure, or altogether unintelligible. This may be owing either to the defective state of our knowledge of the exact nature of many of the phenomena of life, or to the great difficulty of appreciating every circumstance connected with the fact in question, or to constitutional peculiarities in particular species, which, like animal idiosyncrasy, form exceptions to the ordinary laws of nature, and baffle all philosophy.

It is in the writings of Vegetable Physiologists that is to be found what is known of the relation of Botany to the cultivation of Plants; but it is always so mixed up with other matter, that an ordinary reader is unable to tell what bears upon Horticulture and what upon other subjects.

I am not aware that there is at present, in any language, a work exclusively designed to separate that part of Vegetable Physiology, which relates to the Science of Cultivation, from what appertains to pure Botany, or to other subjects; nor can I learn that such an undertaking is in contemplation.

I am, therefore, induced to lay the following little work before the public; first, by a persuasion that it is better that the attempt should be made imperfectly, than not made at all; and, secondly, by the very favorable reception that has been given to a few hasty ideas upon this subject which I ventured to sketch out for a work * published some months ago.

The following propositions are prepared upon the same plan as those of an elementary work upon Botany †, originally drawn up for the use of the botanical class in the University of London.

A similar object has here also been kept in view. My intention has not been to write a work on the Philosophy of Horticulture; but simply to point out in the briefest manner, consistent with clearness, what the fundamental principles of that Philosophy have been ascertained to be.

The application of these principles has been necessarily, in all cases, very concise; but there will be no disadvantage if the work acts as an exercise of the reasoning powers, as well as a guide to practice.

It may, perhaps, be thought that several points have been omitted, which it would have been desirable to introduce, such as the influence upon vegetation of electricity, manures, pruning, training, and the various modes of grafting.

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* Guide to the Orchard and Kitchen Garden, by George Lindley, C. M. H. S. 8vo. 1831.

† Out ine of the first principles of Botany. 18mo. 2d edition. London, 1831.

But it is possible that a little consideration may show that these subjects do not strictly come within the scope of the following pages.

In the first place, a distinction must be drawn between the *Art* and the *Science* of Horticulture; the former teaches the manner, the latter the reasons of cultivation; and it is to the latter only that these propositions apply. Secondly, the plan of this sketch excludes every thing that is merely speculative, or that is incapable of being reduced within certain fixed principles.

Electricity is a power of which we know almost nothing certain, with reference to vegetation; if many things have been written about it, it must be admitted, at least, that very little has been proved.

The same may be said of manures: the theory of their action is explained at paragraphs 19, 262, and 266.

Pruning and training are a part of the Art of Cultivation, dependent upon a great variety of physiological laws, the brief explanation of which is the object of this work. A few hints upon the subject will, however, be found in chapters III, IV, VI, and VIII.

The various modes of grafting are also a part of the *art* of Horticulture: and are deduced from laws explained in the XIVth chapter.

To conclude; the reader should, above all things bear in mind, that he ought not to form his opinion upon any point from the mere consideration of one or two isolated propositions, but of the whole of the phenomena which is to be the object of the following pages to explain. For he will find that the vital actions of plants are so dependent upon each other, and of so complicated a nature, that, while the whole can be only understood by a study of the parts, neither can any of the parts be exactly understood, without a knowledge of the whole.

I. *General Nature of Plants.*

1. Horticulture is the application of the arts of cultivation, multiplication, and domestication, to the vegetable kingdom. Agriculture and Arboriculture are branches of Horticulture.

2. The vegetable kingdom is composed of living beings, destitute of sensation, with no power of moving spontaneously from place to place, and called plants.

3. Plants are organized bodies, consisting of masses of tissue that is permeable by fluids or gaseous matter.

4. Vegetable tissue consists either of minute bladders, or tubes adhering by their contiguous surfaces, and leaving intermediate passages where they do not touch.

5. Tissue is called *Cellular* when it is composed of minute bladders, which either approach the figure of a sphere, or are obviously some modification of it, supposed to be caused by extension or lateral compression.

6. When newly formed, it is in a very lax state, and possesses great powers of absorption; probably in consequence of the excessive permeability of its membrane and the imperfect cohesion of its cells.

7. Cellular tissue, otherwise called Parenchyma, constitutes the soft and brittle parts of plants; such as pith, pulp, the spaces between the veins of leaves, the principal part of the petals; and the like.

8. Succulent plants are such as have an excessive developement of the cellular tissue.

9. It may be considered the most essential kind of tissue, because, while no plants exist without it, many are composed of nothing else.

10. Tissue is called *Woody Fibre* when it is composed of slender tubes, which are conical and close at each end, and placed side by side.

11. Woody Fibre is what causes stiffness and tenacity in certain parts of plants; hence it is found in the veins of leaves, and in bark, and it constitutes the principal part of the wood.

12. *Vascular Tissue* is that in which either an elastic tough thread is generated spirally within a tube that is closed and conical at each end; or rows of cylindrical cellules placed end to end, finally becoming continuous tubes by the loss of their ends.

13. The most remarkable form of vascular tissue is the *Spiral vessel*, which has the power of unrolling with elasticity when stretched.

14. Other kinds of vascular tissue are incapable of unrolling, but break when stretched.

15. Spiral vessels are not found in the wood or bark, and rarely in the roots of plants.

16. Vascular tissue of other kinds is confined to the root, stem, veins of leaves, petals, and other parts composed of leaves. It is not found in bark.

17. The common office of the tissue is to convey fluid or air, and not to act as the receptacle of secretions.

18. Cellular tissue conveys fluids in all directions, absorbs with great rapidity, is the first cause of the adhesion that take place between contiguous parts, and is the principal receptacle of secreted matter.

19. Adhesion will take place at all times during the growing season, when the cellular tissue of two different parts, or of two different plants, is kept for sometime in contact; but as none but tissues of nearly the same nature will adhere, grafting and budding, which are caused by the adhesion of contiguous parts, can only take place either between different varieties of the same species, or between nearly related species; and even then, only when the corresponding parts of the scion or bud, and the stock, are placed in contact.

20. Woody fibre conveys fluid in the direction of its length, gives stiffness and flexibility to the general system, and acts as a protection to spiral and other delicate vessels.

21. Spiral vessels convey oxygenated air.

22. Other vessels probably conduct fluid when young, and air when old.

23. As the bodies of which all tissue is composed are perfectly simple, unbranched, and regular in figure, having when elongated, their two extremities exactly alike, they are more or less capable of conveying gaseous matter or fluids in any direction; and, consequently, a current may be reversed in them without inconvenience; hence, inverted cuttings or stems will grow.

24. All parts of plants are composed of tissue, whether they be soft, as the pulp, or hard as the bony lining of a Peach.

25. With regard to Horticultural operations, the parts of plants should be considered under the

heads of *Root* (II); *Stem* (III); *Leaf-buds* (IV); *Leaves* (V); *Flowers* (VI); *Sexes* (VII); *Fruit* (VIII); and *Seed* (IX).

II. *Root.*

26. The root is the part that strikes into the earth when a seed begins to germinate, and which afterwards continues to lengthen beneath the soil.

27. It is also the part which is sometimes emitted by the stem, for the purpose of absorbing nutriment from the atmosphere; as in Ivy, Air-plants, Vines, &c.

28. It is distinguished from the stem by the absence of leaves in any state, of regular leaf-buds (IV.); of evaporating pores (or stomata) (131); and of pith in Exogenous plants.

29. Therefore, such underground bodies as those called Tuber (16) in the Potato Bulb; (96.) in the Onion; and solid Bulb or Cormus (61.) in the Crocus, are not roots.

30. The office of the root is to absorb food in a fluid or gaseous state; and also to fix the plant in the soil, or to some firm support.

31. The latter office is essential to the certain and regular performance of the former.

32. It is not by the whole of their surface that roots absorb food; but only by their young and newly formed extremities, called *Spongioles*.

33. Hence the preservation of the spongioles in an uninjured state is essential to the removal of a plant from one place to another.

34. A Spongiole consists of very young vascular tissue (12.) surrounded by very young cellular substance. (5.)

35. It is therefore one of the most delicate parts of plants, and the most easily injured.

36. Hence whatever is known to produce any specific deleterious action upon leaves or stems, such as certain gases (298.) and mineral or vegetable poisons, will produce a much more fatal effect upon the spongioles.

37. These organs have no power of selecting their food, but will absorb whatever the earth or air may contain, which is sufficiently fluid to pass through the sides of their tissue.

38. So that if the spongioles are developed in a medium which is of an unsuitable nature, as they will still continue to absorb, they cannot fail to introduce matter which will prove either injurious or fatal to life, according to its intensity.

39. This may often explain why trees suddenly become unhealthy, without any external apparent cause.

40. Plants have the power of replacing spongioles by the formation of new ones; so that an individual is not destroyed by their loss.

41. But this power depends upon the co-operation of the atmosphere, and upon the special vital powers of the species.

42. If the atmosphere is so humid as to hinder evaporation, spongioles will have time to form anew; but if the atmosphere is dry, the loss by evaporation will be so much greater than can be supplied by the injured roots, that the whole system will be emptied of fluid before the new spongioles can form.

43. This is the key to transplantation. (XV.)

44. As roots are destitute of leaf-buds (VI), and as leaf-buds are essential to the multiplication of an individual (108.), it should follow that roots can never be employed for the purpose of multication.

45. Nevertheless, roots, when woody, have, occasionally, the power of generating adventitious leaf-buds (IV.); and when this is the case, they may be employed for the purpose of multiplication; as those of Cydonia, Japonica, &c.

46. The cause of this power existing in some species, and not in others, is unknown.

47. It is therefore a power than can never be calculated upon; and whose existence is only to be discovered by accident.

48. Although roots are generated under ground, and sometimes at considerable depths, yet access to a certain quantity of atmospheric air appears indispensable to the healthy execution of their functions. This is constantly exemplified in plants growing in the earth at the back of an ill-ventilated forcing house, where the roots have no means of finding their way into the earth on the outside of the house.

49. It is supposed by some, that the introduction of oxygen into their system is as indispensable to them as to animals.

50. It seems more probable that the oxygen of the atmosphere, seizing upon a certain quantity of carbon, forms carbonic acid, which they absorb, and feed upon.

51. It is at least certain that the exclusion of air from the roots will always induce an unhealthy condition, or even death itself. This may be one of the reasons why stiff tenacious soils are so seldom suited to the purposes of the cultivator, until their adhesiveness has been destroyed by the addition of other matter.

52. Spongioles secrete excrementitious matter which is unsuitable to the same species afterwards as food; for poisonous substances are as fatal to the species that secrete them, as to any other species.

53. But to other species the excrementitious matter is either not unsuitable, or not deleterious.

54. Hence, soil may be rendered impure (or as we inaccurately say, worn out,) for one species, which will not be impure for others.

55. This is the true key of the theory of rotation of crops.

56. This also may serve to explain in part why light soil is indispensible to so many plants, and heavy or tenacious soil suitable to so few; for in the former case the spongioles will meet with little resistence to their elongation, and will consequently be continually quitting the place when their excrementitious matter is deposited; while in the latter case, the reverse will occur.

III. *Stem.*

57. The stem is that part of a plant, which is developed above-ground, and which took an upward direction at the period of gemination.

58. It consists of a woody axis, covered by bark having stomata (131.) on its surface, bearing leaves with leaf-buds, in their axillæ, and producing flowers and fruit.

59. The points where leaves are borne are called *Nodi*; the spaces between the leaves are *Internodia.*

60. The more erect a stem grows, the more vigorous it is; and the more it deviates from this direction to a horizontal or pendulous position, the less is it vigorous.

61. Some stems are developed underground, such as the Tubers of the Potato and the Cormus of the Corcus; but they are known from roots by the presence of leaves, and regular leaf-buds upon their surface.

62. Stems increase in diameter in two ways.

63. Either by the addition of new matter to the outside of the wood and the inside of the bark; when they are *Exogenous;* example, Oak.

64. Or by the addition of new matter to their inside; when they are *Endogenous ;* ex. Cane.

65. In Exogenous stems, the central portion, which is harder and darker than that at the circumference, is called *Heart-wood;* while the exterior, which is softer and lighter, is called *Alburnum*, or *Sapwood.*

66. The inside of the bark of such stems has also the technical name of *Liber.*

67. The Heart-wood was, when young, Alburnum, and afterwards changed its nature, by becoming the receptacle of certain secretions peculiar to the species.

68. Hence the greater durability of Heart-wood than of Sap-wood. While the latter is newly formed empty tissue, almost as perishable as bark itself, the former is protected against destruction by the introduction of secretions that become solid matter, which is often insoluble in water and never permeable to air.

69. The secretions by which Heart-wood is solidified are prepared in the leaves, whence they are sent downwards through the bark, and from the bark communicated to the central part of the stem.

70. The channels through which this communication takes place are called *Medullary Rays*, or *Silver Grains.*

71. Medullary rays are plates of cellular tissue, in a very compressed state, passing from the pith into the bark.

72. The wood itself is composed of tubes, consisting of woody fibre and vascular tissue, imbedded longitudinally in cellular substance.

73. This cellular substance only developes horizontally; and it is to it that the peculiar character of different kinds of wood is chiefly due.

74. For this reason the wood of the stock of a grafted plant will never become like that of its scion, although as will be hereafter seen (IV.), the woody matter of the stock must all originate in the scion.

75. The stem of an exogenous plant may therefore be compared to a piece of linen, of which the weft is composed of cellular tissue, and the warp of fibrous and vascular tissue.

76. In the spring and autumn a viscid substance is secreted between the wood and the liber, called the *Cambium.*

77. This Cambium appears to be the matter out of which the cellular horizontal substance of the stem is organized.

78. In Endogenous stems the portion at the circumference is harder than that in the centre; and there is no separable bark.

79. Their stems consist of bundles of woody matter, imbedded in cellular tissue, and composed of vascular tissue surrounded by woody fibre.

80. The stem is not only the depository of the peculiar secretions of species (67.), but is also the medium through which the sap flows in its passage from the roots into the leaves.

81. In Exogenous stems (63.) it certainly rises through the alburnum, and descends through the bark.

82. In Endogenous stems (64.) it probably rises through the bundles of wood, and descends through the cellular substance; but this is uncertain.

83. Stems have the power of propagating an individual only by the means of the Leaf-buds. If destitute of Leaf-buds, they have no power of multiplication, except fortuitously.

IV. *Leaf-Buds.*

84. Leaf-buds are rudiments of branches enclosed within scales, which are imperfectly formed leaves.

85. All the leaf-buds upon the same branch are constitutionally and anatomically the same.

86. They are of two kinds; viz: *regular* or *normal*, and *adventitious* or *latent.* (119.)

87. Regular leaf-buds are formed at the axillæ of Leaves.

88. They are organs capable of propagating the individual from which they originate.

89. They are at first nourished by the fluid lying in the pith, but finally established for themselves a communication with the soil by the woody matter which they send downwards.

90. Their force of developement will be in proportion to their nourishment; and, consequently, when it is wished to procure a young shoot of unusual vigor, all other shoots in the vicinity are prevented growing, so as to accumulate for one shoot only all the food that would otherwise have been consumed by several.

91. Cutting back to a few eyes is an operation in pruning to produce the same effect, by directing the sap, as it ascends, into two or three buds only, instead of allowing it to expend itself upon all the others which are cut away.

92. When leaf-buds grow, they develope in three directions; the one horizontal, the other upward, and the third downward.

93. The horizontal developement is confined to the cellular system of the bark, pith, and medullary rays.

94. The upward and downward developements are confined to the woody fibre and vascular tissue.

95. In this respect they resemble seeds; from which they differ physiologically in propagating the individual, while seeds can only propagate the species.

96. When they disarticulate from the stem that bears them, they are called *bulbs.*

97. In some plants, a bud, when separated from its stem, will grow and form a new plant, if placed in circumstances favorable to the preservation of its vital powers.

98. But this property seems confined to plants having a firm, woody perrennial stem.

99. Such buds when detached from their parent stem, send roots downwards and a stem upwards.

100. But if the buds are not separated from the plant to which they belong, the matter they send downwards becomes wood and liber, (66.), and the stems they send upwards, become branches. Hence it is said that wood and liber are formed by the roots of leaf-buds.

101. If no leaf-buds are called into action, there will be no addition of wood; and consequently,

the destruction or absence of leaf-buds is accompanied by the absence of wood: as is proved by a shoot, the upper bud of which is destroyed, and the lower allowed to develope. The lower part of the shoot will increase in diameter: the upper will remain of its original dimensions.

102. The quantity of wood, therefore, depends upon the quantity of leaf-buds that develope.

103. It is of the greatest importance to bear this in mind in pruning timber trees: for excessive pruning must necessarily be injurious to the quantity of produce.

104. If a cutting with a leaf-bud on it be placed in circumstances fitted to the developement of the latter, it will grow and become a new plant,

105. If this happens when the cutting is inserted in the earth, the new plant is said by gardeners *to be upon its own bottom.*

106. But if it happens when the cutting is applied to the dissevered end of another individual, called *a stock*, the roots are insinuated into the tissue of the stock, and a plant is said to *be grafted*, the cutting being called a *scion.*

107. There is, therefore, little difference between cuttings and scions, except that the former root into the earth, the latter into another plant.

108. But if a cutting of the same plant, without a leaf-bud upon it, be placed in the same circumstances, it will not grow, but will die.

109. Unless its vital powers are sufficient to enable it to develope an adventitious leaf-bud. (119.)

110. A leaf-bud separated from the stem will also become a new individual, if its vital energy is sufficiently powerful.

111. And this, whether it is planted in earth, into which it roots, like a cutting, or in a new individual to which it adheres and grows like a scion. In the former case it is called *an eye*, in the latter a *bud.*

112. Every leaf-bud has, therefore, its own distinct system of life, and of growth.

113. And as all the leaf-buds of an individual are exactly alike, it follows that a plant is a collection of a great number of distinct identical systems of life, and consequently a compound individual.

114. Regular leaf-buds being generated in the axillæ of the leaves, it is there that they are always to be sought.

115. And if they cannot be discovered by ocular inspection, it may nevertheless be always inferred with confidence that they exist in such situations, and may possibly be called from their dormant state into life.

116. Hence, wherever the scar of a leaf or the remains of a leaf can be discovered, there it is to be understood that the rudiments exist of a system of life which may be, by favorable circumstances, called into action.

117. Hence, all parts upon which leaves have ever grown, may be made use of for purposes of propagation.

118. From these considerations it appears that the most direct analogy between the Animal and Vegetable Kingdoms, is with the Polypes of the former.

119. Adventitious leaf-buds are in all respects like Regular leaf-buds, except that they are not formed at the axillæ of leaves but are developed occasionally from all and any parts of a plant.

120. They are occasionally produced by roots, by solid wood, or even by leaves and flowers.

121. Hence roots, solid wood, or even leaves and flowers may be used as means of propagation.

122. But as the developement of adventitious buds is extremely uncertain, such means of propagation can never be calculated on; and form no part of the *science* of cultivation.

123. The cause of the formation of adventious leaf-buds is unknown.

124. From certain experiments, it appears that they may be generated by sap in a state of great accumulation and activity.

125. Consequently, whatever tends to the accumulation of sap, in an active state, may be expected to be conductive to the formation of adventitious leaf-buds.

V. *Leaves.*

126. Leaves are expansions of bark, traversed by veins.

127. The veins consist of spiral vessels enclosed in woody fibre; they originate in the medullary sheath and liber; and they are connected by loose Parenchyma [7.] which is full of cavities containing air.

128. This parenchyma consists of two layers, of which the upper is composed of cellules perpendicular to the cuticle, and the lower of cellules parallel with the cuticle.

129. These cellules are arranged so as to leave numerous open passages among them for the circulation of air in the inside of a leaf. Parenchyma of this nature is called *cavernous.*

130. Cuticle is formed of one or more layers of depressed cellular tissue, which is generally hardened, and always dry and filled with air.

131. Between many of the cells of the cuticle are placed apertures called *stomata*, which have the power of opening and closing as circumstances may require.

132. It is by means of this apparatus that leaves elaborate the sap which they absorb from the alburnum, converting it into the secretions peculiar to the species.

133. Their cavernous structure (129.) enables them to expose the greatest possible surface of their parenchyma to the action of the atmosphere.

134. Their cuticle is a non-conducting skin, which protects them from great variations in temperature, and through which gaseous matter will pass readily.

135. Their stomata are pores that are chiefly intended to facilitate evaporation; for which they are well adapted, by a power they possess of opening or closing as circumstances may require.

136. They are also intended for facilitating the rapid emission of air, when it is necessary that such a function should be performed.

137. The functions of stomata being of such vital importance, it is always advisable to examine them microscopically, in cases where doubts are entertained of the state of the atmosphere, which a particular species may require.

138. Leaves growing in air are covered with a cuticle.

139. Leaves growing under water have no cuticle,

140. All the secretions of plants being formed

in the leaves, or at least the greater part, it follows that secretions cannot take place if leaves are destroyed.

141. And as this secreting property depends upon specific vital powers connected with the decomposition of carbonic acid, and called into action only when the leaves are freely exposed to light and air (279.), it also follows that the quantity of secretion will be in direct proportion to the quantity of leaves, and to their free exposure to light and air.

142. The usual position of leaves is spiral, at regularly increasing or diminishing distances; they are then said to be alternate.

143. But if the space, or the axis, that separates two leaves, is reduced to nothing, at alternate intervals, they become opposite.

144. And if the spaces that separate several leaves be reduced to nothing, they become verticillate.

145. Opposite and verticillate leaves, therefore differ from alternate leaves only in the spaces that separate them being reduced to nothing.

VI. *Flowers.*

146. Flowers consist of two principal parts, viz. *Floral Envelopes* (149.) and *Sexes* (VII.)

147. Of these, the former constitute what is popularly considered the flower; although the latter are the only parts that are absolutely essential to it.

148. However different they may be in appearance from leaves, they are all formed of those organs in a more or less modified state, and altered in a greater or less degree by mutual adhesion.

149. The Floral Envelopes consist of two or more whorls of transformed leaves; of which part is calyx, its leaves being called sepals, and part corolla, its leaves being called petals.

150. The Sexes are also transformed leaves. (187.)

151. The calyx is always the outermost, the corolla is always the innermost whorls; and if there is but one floral envelope, that one is calyx.

152. Usually the calyx is green, and the corolla colored and more highly developed; but the reverse is frequently the case, as in Fuchsia, Ribes sanguineum, &c.

153. A Flower being, then, an axis surrounded by leaves, it is in reality a stunted branch; that is, one the growth of which is checked, and its power of elongation destroyed.

154. That Flowers are stunted branches is proved, firstly, by all their parts, especially the most external, occasionally reverting to the state of ordinary leaves; secondly, by their parts being often transformed into each other; and thirdly, by the whorls of flower-buds being dislocated and actually converted into branches, whenever any thing occurs to stimulate them excessively.

155. Their most essential distinctive character consists in the buds at the axillæ of their leaves being usually dormant, while those in the axillæ of ordinary leaves are unusually active.

156. For this reason, while Leaf-buds can be used for the purpose of propagation, flower-buds cannot usually be so employed.

157. Being stunted branches, their position on the stem is the same as that of developed branches.

158. And as there is in all plants a very great difference in the developement of leaf-buds, some growing readily into branches, others only unfolding their leaves without elongating, and many remaining altogether dormant, it follows that flower-buds may form upon plants of whatever age, and in whatever state.

159. But to produce a general formation of flower-buds, it is necessary that there should be some general predisposing constitutional cause, independent of accidental circumstances.

160. This predisposing cause is the accumulation of sap and of secreted matter.

161. Therefore, whatever tends to retard the free flow of sap, and causes it to accumulate, will cause the production of flower-buds, or fertility.

162. And on the other hand, whatever tends to produce excessive vigor, causes the dispersion of sap, or prevents its elaboration, and causes sterility.

163. Transplantation with a partial destruction of roots, age, or high temperature accompanied by a dry atmosphere, training obliquely or in an inverted direction, a constant destruction of the extremities of young growing branches, will all cause an accumulation of sap, and secretions; and consequently all such circumstances are favorable to the production of flower-buds.

164. But a richly manured soil, high temperature, with great atmospheric humidity, or an uninterrupted flow of sap, are all causes of excessive vigor, and are consequently unfavorable to the production of flower-buds.

165. There is a tendency in many flowers to enlarge, to alter their colors, or to change their appearance by a transformation and multiplication of their parts, whenever they have been raised from seeds for several generations, or domesticated.

166. The causes of this tendency are probably various, but being entirely unknown, no certain rules for the production of varieties in flowers can be laid down, except by the aid of hybridizing. (210.)

167. It often happens that a single branch produces flowers different from those produced on other branches. This is technically called a sport.

168. As every bud on that branch has the same specific vital principle (113.), a bud taken from such a branch will produce an individual, the whole of whose branches will retain the character of the sport.

169. Consequently, by buds, an accidental variety may be made permanent, if the plant that sports be of a firm woody nature. (98.)

170. As flowers feed upon the prepared sap in their vicinity, the greater the abundance of this prepared food, the more perfect will be their developement.

171. Or the fewer the flowers on a given branch, the more food they will severally have to nourish them, and the more perfect will they be.

172. The beauty of flowers will therefore be increased either by an abundant supply of food, or by a diminution of their numbers (thinning), or by both. The business of the pruner is to cause these operations.

173. The beauty of flowers depends upon their free exposure to light and air, because it consists in the richness of their colors, and their colors are only formed by the action of those two agents. (281.)

174. Hence Flowers produced in dark or shady

confined situations, are either imperfect, or destitute of their habitual size and beauty.

175. Double Flowers are those in which the stamens are transformed into petals; or in which the latter, or the sepals, are multiplied. They should not be confounded with *Proliferous* (183.) and *Discoid Compound Flowers.* (184.)

176. Although no certain rules for the production of double flowers can be laid down, yet it is probable that those flowers have the greatest tendency to become double, in which the sexes are habitually multiplied.

177. In Icosandrous and Polyandrous plants either the stamens or the pistilla are always very numerous when the flowers are in a natural state; and it is chiefly in such plants that double flowers occur, when they become transformed.

178. It is therefore in such plants that double flowers are to be principally expected.

179. In proportion as the sexes of flowers habitually become few in number, do the instances of double flowers become rare.

180. Double Flowers are therefore least to be expected in plants with fewest stamens.

181. Whenever the component parts of a flower adhere by their edges, as in monophyllous calyxes, monopetalous corollas, and monadelphous, or di-, or poly-adelphous stamens, the tendency to an unnatural multiplication of parts seems checked.

182. Therefore, in such cases Double Flowers are little to be expected; they are in fact, very rare.

183. Proliferous Flowers, are those in which parts that usually have all their axillary buds dormant, accidentally develope such buds; as in the Hen and Chickens Daisy, in which the bracteæ of the involucrum form other Daisy-heads in their axillæ; or, as in certain Roses, in which the carpellary leaves develope leaf-buds in their axillæ, so that the flower becomes a branch, the lower leaves of which are colored and transformed, and the upper, green, and in their ordinary state.

184. Discoid compound Flowers are those in which the central florets of a flower-head acquire corollas, like those of the circumference, as in the Dahlia; the cultivated variety of which should be called discoid, and not double.

185. These two last are so essentially different from double flowers, that whatever laws may be supposed to govern the production or amelioration of double Flowers, can have no relation to proliferous or discoid compound Flowers.

VII. *Sexes.*

186. The sexes consist of two or more whorls of transformed leaves, of which the outer are called *Stamens* (188.), and the inner *Pistillum.* (191.)

187. They are known to be modifications of leaves, because they very frequently are transformed into petals which are demonstrably such (149.); and because they occasionally revert to the state of leaves.

188. The stamens bear at their apex an organ, called the *Anther*, which contains a powder called *pollen.*

189. When the anther is full grown, it opens and emits the pollen, either dispersing it in the air in consequence of the elasticity with which it opens; or depositing it upon the stigma (191.); or exposing it to the action of wind, or such other disturbing causes as may liberate it from its case.

190. The pollen consists of exceedingly minute hollow balls, or cases containing myriads of moving particles, which are the fertilizing principle of the stamens.

191. The pistillum has at its base one or more cavities or *cells*, in which bodies called *ovula* are placed; and at its apex, one or more secreting surfaces, called *stigmata.*

192. The ovula are the rudiments of seeds.

193. If the fertilizing powder of the pollen come in contact with the stigma, the ovula in the cells of the pistillum are vivified, and become seeds.

194. But if this contact does not take place, the ovula cannot possibly be vivified, but shrivel up and perish.

195. The phenomena of vivification takes place in consequence of the descent of a portion of the moving particles (190.) of the pollen into the ovula, where such particles form the commencement of future plants.

196. In wild plants, a stigma is usually acted upon only by the pollen of the stamens which belong to it.

197. In this case, the seeds thus vivified, will, when sown, produce new individuals, differing very little from that by which they were themselves produced.

198. And, therefore, wild plants are for the most part multiplied from generation to generation without change.

199. But it is possible to cause deviations from this law, by artificial means.

200. If the pollen of one species is placed upon the stigma of another species, the ovula will be vivified; and what is called a *hybrid* plant will be produced, by those ovula when they shall have grown to be seeds.

201. Hybrid plants are different from both their parents, and are generally intermediate in character between them.

202. They have little power of perpetuating themselves by seeds, but they may, if wood, be perpetuated by cuttings (312.), buds (354.) scions (335.), &c.

203. Therefore, no hybrids but such as are of a woody parennial character can be perpetuated.

204. It usually happens that the hybrid has the constitution and general aspect of the polleniferous parent; but is influenced in secondary characters by the peculiarity of the female parent.

205. This should always be borne in mind, in procuring new hybrid plants.

206. Real hybrid plants must not be confounded with such as are spurious, in consequence of their origin being between two varieties of the same species, and not two species of the same genus.

207. Hybrid plants, although incapable of perpetuation by seed, are often more abundant flowerers than either parent.

208. This is, probably, connected with constitutional debility. (162.)

VIII. *Fruit.*

209. Fruit, strictly speaking, is the pistillum arrived at maturity.

210. When the calyx adheres to the pistillum, and grows with it, to maturity, the fruit is called *inferior;* as the apple.

211. But when the pistillum alone ripens, there being no adhesion to it on the part of the calyx, the fruit is called *superior;* as the peach.

212. The fruit is, therefore, in common language, the flower, or some part of it, arrived at its most complete state of existence; and, consequenly, is itself a portion of a stunted branch. (153.)

213. The nature of its connection with the stem is therefore the same as that of the branches with each other, or of leaves with their stem.

214. A superior fruit, consisting only of one, or of a small number of metamorphosed leaves, has little or no power of forming a communication with the earth and of feeding itself, as real branches have. (89.)

215. It has also very little adhesion to its branch; so that but slight causes are sufficient to detach it from the plant, especially at an early age, when all its parts are tender.

216. Hence the difficulty of causing peaches and the like to *stone*, or to pass over that age, in which the vascular bundles that join them to the branch become woody, and secure them to their place.

217. For the same reason they are fed almost entirely by other parts, upon secreted matter which they attract to themselves, elaborate, and store up in the cavities of their tissue.

218. The office of feeding such fruit is performed by young branches which transmit nutriment to it through the bark. (69.)

219. But as young branches can only transmit nutriment downwards, it follows that unless a fruit is formed on a part of a branch below a leaf bud, it must perish.

220. Unless there is some active vegetation in the stem above the branch on which it grows; when it may possibly live and feed upon secretions attracted by it from the main stem.

221. But inferior fruit, consisting at least of the calyx in addition to the pistillum, has a much more powerful communication with the branch; each division of its calyx having *at least* one bundle of vascular and fibrous tissue, passing from it into the branch, and acting as a stay upon the centre to prevent its breaking off.

222. Such fruit may be supposed much more capable of establishing a means of attracting secretions from a distance; and consequently, is less liable to perish from want of a supply of food.

223. It is therefore not so important that an inferior fruit should be furnished with growing branches above it.

224. Fruit is exclusively fed by the secretions prepared for it by other parts; it is therefore affected by nearly the same circumstances as flowers.

225. It will be large in proportion to the quantity of food the stem can supply to it; and small in proportion to the inability of the stem to nourish it.

226. For this reason, when trees are weak, they should be allowed to bear very little, if any, fruit; because a crop of fruit can only tend to increase their debility.

227. And in all cases each fruit should be so far separated from all others, as not to be robbed of its food by those in its vicinity.

228. We find that nature has herself in some measure provided against injury to plants by excessive fecundity, in giving them a power of throwing off flowers, the fruit of which cannot be supported.

229. The flavor of fruit depends upon the existence of certain secretions, especially of acid and sugar; flavor will, consequently, be regulated by the circumstances under which fruit is ripened.

230. The ripening of fruit is the conversion of acid and other substances into sugar.

231. As the latter substance cannot be obtained at all in the dark, is less abundant in fruit ripened in diffused light, and most abundant in fruit exposed to the direct rays of the sun, the conversion of matter into sugar occurs under the same circumstances as the decomposition of carbonic acid. (141 and 279.)

232. Therefore, if fruit be produced in situations much exposed to the sun, its sweetness will be augmented.

233. And in proportion as it is deprived of the sun's direct rays, that quality will diminish.

234. So that a fruit, which when exposed to the sun is sweet, when grown where no direct light will reach it, will be acid; as Pears, Cherries, &c.

235. Hence acidity may be corrected by exposure to light; and excessive sweetness, or insipidity, by removal from light.

236. It is the property of succulent fruits which are acid when wild, to acquire sweetness when cultivated, losing a part of their acid.

237. This probably arises from the augmentation of the cellular tissue, which possibly has a greater power than woody or vascular tissue of assisting in the formation of sugar.

238. As a certain quantity of acid is essential to render fruit agreeable to the palate, and as it is the property of cultivated fruits to add to their saccharine matter, but not to form more acid than when wild, it follows, that in selecting wild fruits for domestication, those which are acid should be preferred, and those which are sweet or insipid rejected.

239. Unless recourse is had to hybridism; when a wild insipid fruit may be possibly improved (204.), or may be the means of improving something else.

240. It is very much upon such considerations as the foregoing that the rules of training must depend.

IX. *Seed.*

241. The seed is the ovulum arrived at perfection.

242. It consists of an integument enclosing an *embryo*, which is the rudiment of a future plant.

243. The seed is nourished by the same means as the fruit; and, like it, will be more or less perfectly formed, according to the abundance of its nutriment.

244. The plant developed from the embryo in the seed, will be in all essential particulars like its parent species.

245. Unless its nature has been changed by hybridizing. (204.)

246. But although it will certainly, under ordinary circumstances, reproduce its species, it will by no means uniformly reproduce the particular variety by which it was borne.

247. So that seeds are not the proper means of propagating varieties.

248. Nevertheless, in annual or biennial plants, no means can be employed for propagating a variety, except the seeds; and yet the variety is preserved.

249. This is accomplished solely by the great care of the cultivator, and happens thus.

250. Although a seed will not absolutely propagate the individual, yet as a seed will partake more of the nature of its actual parent than of any thing else, its progeny may be expected, as really happens, to resemble the variety from which it sprung, more than any other variety of its species.

251. Provided its purity have not been contaminated by the intermixture of other varieties.

252. By a careful eradication of all the varieties from the neighborhood of that from which seed is to be saved, by taking care that none but the most genuine forms of a variety are preserved as seed-plants, and by compelling by transplantation a plant to expend all its accumulated sap in the nourishment of its seeds, instead of in the superabundant production of foliage, a crop of seed may be procured, the plants produced by which will, in a great measure, have the peculiar properties of the parent variety.

253. By a series of progressive seed-savings upon the same plan, plants will be at length obtained, in which the habits of the individual have become as it were fixed, and capable of such exact reproduction by seed, as to form an exception to the general rule; as in Turnips, Radishes, &c.

254. But if the least neglect occurs in taking the necessary precautions (252.) to ensure a uniform crop of seed, possessing the new fixed properties, the race becomes deteriorated, in proportion to the want of care that has occurred, and loses its characters of individuality.

255. In all varieties, those seeds may be expected to preserve their individual characters most distinctly which have been the best nourished (243.); it is, consequently, those which should be selected in preference for raising new plants, from which seed is to be saved.

256. When seeds are first ripened, their embryo is a mass of cellular substance, containing starch, fixed carbon, or other solid matter in its cavities; and in this state it will remain until fitting circumstances occur to call it into active life.

257. These fitting circumstances are, a temperature above 32 degrees Fahr., a moist medium, darkness, and exposure to air.

258. It then absorbs the moisture of the medium in which it lies, inhales oxygen (278.), and undergoes certain chemical changes; its vital powers cause it to ascend by one extremity for the purpose of finding light, and of decomposing its carbonic acid (279.), by parting with its accumulated oxygen, and to descend by the other extremity for the purpose of finding a constant supply of crude nutriment.

259. Unless these conditions are maintained, seeds cannot germinate; and, consequently an exposure to light is fatal to their embryo, because (278.) oxygen will not be absorbed in sufficient quantity to stimulate the vital powers of the embryo into action, for the purpose of parting with it again, by the decomposition of the carbonic acid that has been formed during its accumulation.

X. *Sap.*

260. The fluid matter which is absorbed either from the earth or from the air is called sap.

261. When it first enters a plant it consists of water holding certain principles, especially carbonic acid, in solution.

262. These principles chiefly consist of animal or vegetable matter in a state of decomposition, and are energetic in proportion to their solubility, or tendency to form carbonic acid by combining with the oxygen of the air.

263. Sap soon afterwards acquires the nature of mucilage or sugar, and subsequently becomes still further altered by the admixture of such soluble matter as it receives in passing in its route through the alburnum, or newly formed woody tissue. (65.)

264. When it reaches the vicinity of the leaves it is attracted into them, and there, having been exposed to light and air, is converted into the secretions peculiar to the species.

265. It finally, in its altered state, sinks down the bark, whence it is given off laterally by the medullary rays, and is distributed through the system.

266. No solid matter whatever can be taken up by the roots; for this reason, metals, which in the state of oxydes are poisonous, are perfectly harmless in their metallic state, as mercury; and this is, no doubt, the cause why liquid manure, which contains all the soluble parts of manure in a fluid state, acts with so much more energy than stimulating substances in a solid state.

267. The cause of the motion of the sap is the attraction of the leaf-buds and leaves.

268. The leaf-buds called into growth by the combined action of the increasing temperature and light of spring, decompose their carbonic acid (279.), and attract fluid from the tissue immediately below them; the space so caused is filled up by fluid again attracted from below, and thus a motion gradually takes place in the sap from one extremity to the other.

269. Consequently the motion of the sap takes place first in the branches, and last in the roots.

270. For this reason a branch of a plant subjected to a high temperature in winter will grow, while its stem is exposed to a very low temperature.

271. But growth under such circumstances will not be long maintained, unless the roots are secured from the reach of frost; for, if frozen they cannot act, and will, consequently be unable to replace the sap of which the stem is emptied by the attraction of the buds converted into branches, and by the perspiration of the leaves. (XII.)

272. Whatever tends to inspissate the sap, such as a dry and heated atmosphere, or an interruption of its rapid flow, or a great decomposition of carbonic acid by full exposure to light, has the property of causing excessive vigor to be diminished, and flower-buds to be produced.

273. While, on the other hand, whatever tends to dilute the sap, such as a damp atmosphere, a free and uninterrupted circulation, or a great accumulation of oxygen in consequence of the imperfect decomposition of carbonic acid, has the property of causing excessively rapid growth, and an exclusive production of leaf-buds.

274. Inspissated or accumulated sap is, therefore, a great cause of fertility.

275. And thin fluid, not being elaborated, is a great cause of sterility.

276. The conversion of sap into different kinds

of secretion is effected by the combined action of *Air* (XI.), *Light* (XI.), and *Temperature.*

XI. *Air and Light.*

277. When an embryo plant (242.) is formed within its integuments, it is usually colorless, or nearly so; but, as soon as it begins to grow, that part which approaches the light (the stem) becomes colored, while the opposite extremity (the root) remains colorless.

278. The parts exposed to the air absorb oxygen at night, absorb carbonic acid and part with oxygen again in daylight; and thus in the daytime purify the air, and render it fit for the respiration of man.

279. The intensity of this latter phenomenon is in proportion to the intensity of solar light to which leaves are directly exposed.

280. Its cause is the decomposition of carbonic acid, the extrication of oxygen, and the acquisition, by the plant, of carbon in a solid state: from which, modified by the peculiar vital actions of species, color, and secretions, are supposed to result.

281. For it is found that the intensity of color and the quantity of secretions are in proportion to the exposure to light and air, as is shown by the deeper color of the upper side of leaves, &c.

282. And by the fact that if plants be grown in air from which light is excluded, neither color nor secretions are formed, as is exemplified in blanched vegetables; which if even naturally poisonous, may, from want of exposure to light, become wholesome, as Celery.

283. When any color appears in parts developed in the dark it is generally caused by the absorption of such coloring matter as pre-existed in the root or other body from which the blanched shoot proceeds, as in some kinds of Rhubarb when forced.

284. Or by the deposition of coloring matter formed by parts developed in light, as in the subterranean roots, of Beet, Carrots, &c.

285. What is true of color is also true of flavor, which equally depends upon light for its existence; because flavor is produced by chemical alterations in the sap caused by exposure to light. (229.)

286. The same thing occurs in regard to nutritive matter, which in like manner is formed by the exposure of leaves to light. Thus the Potato when forced in dark houses contains no more amylaceous matter than previously existed in the original tuber; but acquires it in abundance when placed in the light, and deposites it in proportion as it is influenced by light and air. Thus, also, if Peaches are grown in wooden houses, at a distance from the light, they will form so little nutritive matter as to be unable to support a crop of fruit, the greater part of which will fall off. And for a similar reason it is only the outside shoots of standard fruit trees that bear fruit. Considerations of this kind form in part the basis of pruning and training.

287. Light is the most powerful stimulus that can be employed to excite the vital actions of plants, and its energy is in proportion to its intensity; so that the direct rays of the sun will produce much more powerful effects than the diffused light of day.

288. Hence, if buds that are very excitable are placed in a diffused light, their excitability will be checked.

289. And if buds that are very torpid are exposed to direct light, they will be stimulated into action.

290. So that what parts of a tree shall first begin to grow in the spring may be determined at the will of the cultivator.

291. This is the key to some important practices in forcing.

292. This should also cause attention to be paid to shading buds from the direct rays of the sun in particular cases: as in that of cuttings, whose buds, if too rapidly excited, might exhaust their only reservoir of sap, the stem, before new roots were formed to repair such loss.

293. As plants derive an essential part of their food from the air (280.) by the action of light, it follows that in glass-houses those which admit the greatest portion of light are the best adapted for purposes of cultivation.

294. The proportion of opaque matter in the roof of a glass-house constructed of wood varies from a third to a seventh—that of an iron-house does not exceed one twenty-third.

295. Therefore iron-roofed houses are in this respect better suited for cultivation than wooden-roofed houses.

296. And it has been found by experiment, that light passes more freely through a curvilinear than through a plane roof, and through glass forming an acute angle with the horizon than through perpendicular glass; it follows that a curvilinear roof is best, and a plane roof with glass perpendicular sides the worst adapted to the purposes of the cultivator.

297. For the same reason common green glass is less fitted for glazing forcing-houses than white crown glass.

298. Poisonous gases in very minute quantities act upon vegetation with great energy. A ten-thousandth part of sulphurous acid gas is quickly fatal to the life of plants; and hence the danger of flues heated by coal fires, and the impossibility of making many species grow in the vicinity of houses heated by coal fires, or in large towns.

XII. *Perspiration.*

299. It is not, however, exclusively by the action of light and air that the nature of sap is altered. Evaporation is constantly going on during the growth of a plant, and sometimes is so copious, that an individual will perspire its own weight of water in the course of 24 hours.

300. The loss thus occasioned by the leaves is supplied by crude fluid, absorbed by the roots, and conveyed up the stem with great rapidity.

301. The consequence of such copious perspiration is the separation and solidification of the carbonized matter that is produced for the peculiar secretions of a species.

302. For the maintenance of a plant in health, it is indispensable that the supply of fluid by the roots should be continual and uninterrupted.

303. If any thing causes perspiration to take place faster than it can be counteracted by the absorption of fluid from the earth, plants will be dried up and perish.

304. Such causes are, destruction of spongioles, an insufficient quantity of fluid in the soil, an ex-

posure of the spongioles to occasional dryness, and a dry atmosphere.

305. The most ready means of counteracting the evil consequences of an imperfect action of the roots is by preventing or diminishing evaporation.

306. This is to be effected by rendering the atmosphere extremely humid.

307. Thus, in curvilinear iron hot-houses, in which the atmosphere becomes so dry in consequence of the heat, that plants perish, it is necessary that the air should be rendered extremely humid, by throwing water upon the pavement, or by introducing steam.

308. And in transplantation in dry weather, evergreens, or plants in leaf, often die, because the spongioles are destroyed, or so far injured in the operation as to be unable to act, while the leaves never cease to perspire.

309. The greater certainty of transplanting plants that have been growing in pots is from this latter circumstance intelligible;

310. While the utility of putting cuttings or newly transplanted seedlings into a shady damp atmosphere, is explained by the necessity of hindering evaporation.

XIII. *Cuttings.*

311. When a separate portion of a plant is caused to produce new roots and branches, and to increase an individual, it is a cutting.

312. Cuttings are of two sorts—cuttings properly so called, and *eyes.* (319.)

313. A cutting consists of an internodium, or a part of one, with its nodus (59.) and leaf-bud.

314. When the internodium is plunged in the earth it attracts fluid from the soil, and nourishes the bud until it can feed itself.

315. The bud, feeding at first upon the matter in the internodium, gradually elongates upwards into a branch, and sends organized matter downwards, which becomes roots.

316. As soon as it has established a communication with the soil, it becomes a new individual, exactly like that from which it was taken.

317. As it is the action of the leaf-buds that causes growth in a cutting, it follows that no cutting without a leaf-bud will grow.

318. Unless the cutting has great vitality and power of forming adventitious leaf-buds (119.), which sometimes happens.

319. An eye is a leaf-bud without an internodium.

320. It only differs from a cutting in having no reservoir of food on which to exist, and in emitting its roots immediately from the base of the leaf-bud into the soil.

321. As cuttings will very often, if not always, develope leaves before any powerful connection is formed between them and the soil, they are peculiarly liable to suffer from perspiration.

322. Hence the importance of maintaining their atmosphere in an uniform state of humidity, as is effected by putting bell or other glasses over them.

323. In this case, however, it is necessary that if air-tight covers are employed, such as bell glasses, they should be from time to time removed and replaced, for the sake of getting rid of excessive humidity.

321. Layers differ from cuttings in nothing except that they strike root into the soil while yet adhering to the parent plant.

325. Whatever is true of cuttings is true of layers, except that the latter are not liable to suffer by evaporation, because of their communication with the parent plant.

326. As cuttings strike roots into the earth by the action of leaves or leaf-buds, it might be supposed that they will strike most readily when the leaves or leaf-buds are in their greatest vigor.

327. Nevertheless, this power is controlled so much by the peculiar vital powers of different species, and by secondary considerations, that it is impossible to say that this is an absolute rule.

328. Thus Dahlias and other herbaceous plants will strike root freely when cuttings are very young; and Heaths, Azaleas, and other hard wooded plants, only when the wood has just begun to harden.

329. The former is, probably, owing to some specific vital excitability, the force of which we cannot appreciate; the latter either to a kind of torpor, which seems to seize such plants when their tissue is once emptied of fluid, or to a natural slowness to send down woody matter, whether for wood or not, which is the real cause of their wood being harder.

330. If ripened cuttings are upon the whole the most fitted for multiplication, it is because their tissue is less absorbent than when younger, and that they are less likely to suffer either from repletion or evaporation.

331. For to gorge tissue with food, before leaves are in action to decompose and assimilate it, is as prejudicial, as to empty tissue by the action of leaves, before spongioles are prepared to replenish it.

332. For this reason, pure silex, in which no stimulating substances are contained (silver sand) is the best adapted for promoting the rooting of cuttings that strike with difficulty.

333. And for the same reason, cuttings with what gardeners call a *heel* to them, or a piece of the older wood, strike root more readily than such as are not so protected. The greater age of the tissue of the heel renders it less absorbent than tissue that is altogether newly formed.

334. It is to avoid the bad effect of evaporation that leaves are usually for the most part removed from a cutting, when it is first prepared.

XIV. *Scions.*

335. A scion is a cutting (311.) which is caused to grow upon another plant, and not in earth.

336. Scions are of two sorts, scions properly so called, and *buds.* (354.)

337. Whatever is true of cuttings, is true also of scions, all circumstances being equal.

338. When a scion is adapted to another plant, it attracts fluid from it for the nourishment of its leaf-buds, until they can feed themselves.

339. Its buds thus fed gradually grow upwards into branches, and send woody matter downwards, which is analogous to roots.

340. At the same time the cellular substance of the scion and its stock adheres (19.) so as to form a complete organic union.

341. The woody matter descending from the bud passes through the cellular substance into the stock, where it occupies the same situation as

would have been occupied by the woody matter supplied by buds belonging to the stock itself.

342. Once united, the scion covers the wood of the stock with new wood, and causes the production of new roots.

343. But the character of the woody matter sent down by the scion over the wood of the stock being determined by the cellular substance, which has exclusively a horizontal developement (73.), it follows that the wood of the stock will always remain apparently the same, although it is furnished by the scion.

344. Some scions will grow upon a stock without being able to transmit any woody matter into it; as some Cacti.

345. When this happens, the adhesion of the two takes place by the cellular substance only, and the union is so imperfect that a slight degree of violence suffices to dissever them.

346. And in such cases the buds are fed by their woody matter, which absorbs the ascending sap from the stock at the point where the adhesion has occurred; and the lat er, never augmenting in diameter, is finally overgrown by the scion.

347. When, in such instances, the communication between the stock and the scion is so much interrupted that the sap can no longer ascend with sufficient rapidity into the branches, the latter die; as in many Peaches.

348. This incomplete union between the scion and its stock is owing to some constitutional or organic difference in the two.

349. Therefore care should be taken that when plants are grafted on one another, their constitution should be as nearly as possible identical.

350. As adhesion of only an imperfect nature takes place when the scion and stock are, to a certain degree, dissimilar in constitution, so will no adhesion whatever occur when their constitutional differences are very decided.

351. Hence it is only species very nearly allied in nature that can be grafted on each other.

352. As only similar tissues will unite (19.), it is necessary, in applying a scion to the stock, that similar parts should be carefully adapted to each other; as bark to bark, cambium to cambium, and alburnum to alburnum.

353. The second is more especially requisite, because it is through the cambium that the woody matter sent downwards by the buds must pass; and also because cambium itself, being organizing matter in an incipient state, will more readily form an adhesion than any other part.

354. The same principles apply to *buds*, which are to scions precisely what eyes (319.) are to cuttings.

355. Inarching is the same with reference to grafting, that layering (324.) is with reference to striking by cuttings.

356. It serves to maintain the vitality of a scion until it can form an adhesion with its stock; and must be considered the most certain mode of grafting.

357. It is probable that every species of flowering plant, without exception, may be multiplied by grafting.

358. Nevertheless, there are many species and even tribes that never have been grafted.

359. It has been found that in the Vine and the Walnut this difficulty can be overcome by attention to their peculiar constitutions; and it is probable that the same attention will remove supposed difficulties in the case of other species.

XV. *Transplantation.*

360. Transplantation consists in removing a plant from the soil in which it is growing to some other soil.

361. If in the operation the plant is torpid, and its spongioles uninjured, the removal will not be productive of any interruption to the previous rate of growth.

362. And if it is growing, or evergreen, and the spongioles are uninjured, the removal will produce no further injury than may arise from the temporary suspension of the action of the spongioles, and the non-cessation of perspiration during the operation.

363. So that transplantation may take place at all seasons of the year, and under all circumstances, provided the spongioles are uninjured.

364. This applies to the largest trees as well as to the smallest herbs.

365. But as it is impossible to take plants out of the earth without destroying or injuring the spongioles, the evil consequences of such accidents must be remedied by the hindrance of evaporation.

366. Transplantation should therefore take place only when plants are torpid, and when their respiratory organs (leaves) are absent; or, if they never lose those organs, as evergreens, only at seasons when the atmosphere is periodically charged with humidity for some considerable time.

367. Old trees in which the roots are much injured, form new ones so slowly, that they are very liable to be exhausted of sap by the absorption of their very numerous young buds before new spongioles can be formed.

368. The amputation of all their upper extremities is the most probable prevention of death; but in most cases injury of their roots is without a remedy.

369. Plants in pots being so circumstanced that the spongioles are protected from injury, can, however, be transplanted at all seasons, without any dangerous consequences.

From the Cincinnati Daily Gazette.

Lake County, Ia., August 20, 1837.

Editor Gazette: Sir—I am a dweller upon and cultivator of a part of the great western prairies. As often as they have been described, there are many of your readers who have a very erroneous idea of a prairie country. Perhaps a plain description of the native appearance, and mode of breaking up and cultivating, may interest them as much as the history of a quarrel among a society of peace-makers, or a dissertation as to whether it would be better for this humbugged nation to be humbugged by one great humbug, or a thousand little ones.

The most eastern prairies are found in the central parts of Ohio; generally flat wet land, which many suppose is the ruling feature of all prairies. The great chain of prairies commences in Michigan and extends south-westerly to Mexico, increasing in magnitude as they extend west. There is every variety of prairie land, from the "grassy

lakes," like the ever-glades of Florida, to the highest rolling, dry land that abounds in the country. In the prairies in the north of Indiana, the streams are generally bordered with "marsh prairie," sometimes very soft and miry, extending the whole width of what you would call the first bottom, or interval between the bank and high land, and often covered with the most luxuriant growth of grass and rushes, and in shallow streams extending entirely across, so that the old proverb of "can't set the river on fire," dont apply here, for streams of three or four feet depth often burn over. Some streams have no banks—the ground rising in a true grade from the *bottom* of the river for miles—such for instance is the celebrated Kankakee, the marsh of which in places is several miles wide, and a stranger would approach near the channel without once conceiving of the presence of a river which is as large or larger than the Licking, or Great Miami.

This marsh is interspersed with islands of dry prairie and timber—some of which are celebrated in Indian history as having afforded an almost unapproachable retreat for the discomfited army of Tippecanoe. A pursuit of the retreating foe after that battle, would have been found as impracticable as a pursuit of the same kind of foe has been found in Florida. The Kankakee being entirely inaccessible, except in two or three places, from the upper rapids, near the Illinois state line, to the south bend of the St. Joseph; so that the only method of pursuit would have been by boats up the river, past the very muzzles of the Indian rifles, the owners of which could have lain concealed in the tall grass on the banks within ten yards of the passing boats.

It is from the burning of these or similar marsh prairies, that the thousand and one poetical flourishes have been painted, to convey an idea to the uninitiated, of the "sublime and awfully grand spectacle of a burning prairie." And 'tis these descriptions that have conveyed the idea that all prairies are covered with grass so tall that a horseman is in danger of losing himself if he happens to get "off the trail;" when in truth the ordinary growth on a dry prairie is only about 8 or 10 inches of thick, fine grass, that resembles timothy when about half grown, and is usually called "buffalo grass." And when burning, which it generally does about November, it makes a fire about as large as the burning of leaves in wood-land and occasions no more danger; as it runs through an oak rail fence without creating blaze enough to set it on fire.

The prairies hereabouts are moderately undulating, surrounded or interspersed with groves of timber at no inconvenient distances, and watered with durable mill streams and small creeks, springs and lakes, and ponds, varying in size from the fourth of an acre to a thousand acres. Wells of good water are easily obtained, at all depths, from five to a hundred feet, of clay and sand digging.

The quality of the soil is very various, or rather the subsoil—for the whole country appears to be covered with a rich, loose black mould, varying in depth from three to four inches to as many feet. In some places this mould rests on a bed of loose sand, almost quicksand, with a surface as level as water—in others, it rests on a more compact bed of sand and gravel, that takes up the water as fast as it falls, leaving the soil at all times dry and pleasant to work, though very liable to be exhausted.

In other places a bed of sandy loam lies below the top soil, and this sometimes rests on sand and gravel, and sometimes on a compact bed of strong white clay, from one to fifty feet through to the sand. In other places the soil is exactly similar to the upland of Ohio, very strong and durable, and very muddy in wet weather.

Stone is scarce. On some prairies you could not find one as big as your head in a month. On others, detached masses of granite are so plenty as to make ploughing, at first, difficult. Limestone is scarce—though it is beginning to be found, and undoubtedly will be discovered in sufficient quantities as the country grows old. Marl is very abundant, and is used as a substitute for lime. You may think that the want of stone subjects the new settler to serious inconvenience in building his first cabin, where neither brick nor stone can be had to build a fireplace—but "want is the mother of invention." It may be curious, if not to you, who have grown up with log cabins and clearings of the west, yet to some, to know how a good fireplace can be built without either brick or stone. Here then is a specification, and one of far more importance than many a one for which a patent has been granted. After having made the cribbing or wooden frame which forms the outside of common cabin fireplaces, mark off the exact size you wish to have the fireplace, and then set up posts and nail clapboards on to form the shape of the back and jambs, and fill up the space with dry dirt, which must be pounded compactly together as fast as put in, and when of sufficient height, put on the wooden mantle, which should be of white walnut, (butternut) if possible, (as this wood is almost incombustible) and continue the chimney with sticks and clay in the ordinary way. The hearth is made by pounded clay in the same manner as the fireplace, and then a fire being built, gradually burns out the frame of the mould; and if the dirt used was of a quality of clay that would answer for making brick, the fireplace will stand as long, and answer every purpose except in the looks of things, as brick. The hearth will want repairing once a year. With such a fireplace, in a room 16 or 18 feet square, built of round poles or small logs laid up in the form of a rail pen, one above another, and notched together at the corners, and the cracks filled with chunks of woods and daubed with mud, and the floor made of logs split in halves or quarters and roughly hewed, the roof formed of clapboards split about 4 feet long and 6 or 8 inches wide, laid upon poles and held in their places by other poles on top, a door made of the same kind of stuff, hung with wooden hinges, and a few shelves put up on pins fixed in the logs, have lived, and still live, many of the best citizens of the west. You, Mr. Editor, if I mistake not, can speak experimentally upon this matter. Do any of the cits, who have been reduced by the "grippe" from high life above, "to high life below stairs," ever think that as good men as themselves, who have enjoyed life in a parlor, drawing-room and dining-hall, are *now* enjoying life better in such a cabin as above described. And if the deranged state of commercial business should have a tendency to drive a few thousands more into the same kind of enjoyment of life, and to the cultivation of such a soil as I have described, you might truly say that good had sprung from evil.

I conceive that the greatest benefit that could be bestowed upon this nation, would be to cause land *cultivation* to become as fashionable as land speculation.

Specie payments, or specie currency, or a recharter of the U. States Bank, would not bring so great a blessing upon the country, as a recharter of that good old fashion, of farmers, bringing up their sons and daughters to their own trade, and teaching them that it would not be *ungenteel* to follow it. But so long as fashion calls such hosts from the plough and cheese tub, to the counter and milliner's shop, so long the non-producing class should never complain of "high prices" of the necessaries of life. They may cry "flour must come down" until they are hoarse, but it will not come down till their own pride comes down—till they could be contented in the aforesaid log cabin, and become makers of their own flour stuff; and then to them the price would come down.

But I have digressed from my text. I had intended this letter to have been altogether descriptive. However, who shall deny the truth of my short sermon? and let those who realize its truth, profit by it. Is it not the duty of editors, in these times, also to preach these truths constantly? To urge the surplus population of your cities to flee while they can from the trouble yet to come; and if they are unable to buy a small lot of government land, let them become "squatters," and *cultivators;* and by thus assisting to raise a surplus of grain, prevent its importation, while they at the same time are adding riches, health, and happiness, to themselves and families.

The difficulties of getting a farm under cultivation in a heavy timbered country, deters many from the undertaking; and the inability of many, in a pecuniary point, to purchase a cultivated farm, keeps thousands in the cities who would be better away, and who add nothing to the wealth of the community where they get their precarious living; and who would make valuable members of community, if properly situated in a proper place.

Having stretched this to an unreasonable length, I shall defer, to the next communication, to tell you how prairie is "broke up," and how fenced without stone or timber—and how crops are put in, how they grow, and sundry other interesting items, perhaps.

With much respect I am your old friend,

S. R.

From the American Farmer.

LOUDOUN FARMING.

Communicated by Geo. W. Jeffreys, esq., of North Carolina, for publication in the American Farmer.

ALDIE, March 1st, 1819.

Dear Sir—In fulfilment of the promise made you some time ago, I embrace the first leisure moment to answer your anxious inquiries on the subject of Loudoun husbandry, &c.; and in doing so, I shall confine myself entirely to the practice, without attempting to reason from effects to causes; for he who endeavors to recommend to the farmer's practice, a method of cultivation, founded only upon theory, though supported by the most plausible deductions, will be much more likely to lead him into error, than the man who, by the observation of what has happened to himself and others, from one uniform method of practice, ventures to pronounce that the like will happen to all, if all, in like circumstances, will be persuaded to pursue the same course. I will endeavor to answer your queries in the order you have submitted them.

Query 1.—On what soils does plaster succeed best?

Answer.—It is believed, that a hilly, dry, gravelly or loamy soil, that will sink the water quick in winter, to be much the best. I have seen great effects from plaster, when the land was moderately undulatory, and even level, when raised into beds with water-furrows, eight or nine feet apart. Cold, flat, black-jack land, is seldom favorable to it.

Q. 2.—What kinds of crops does it benefit most?

A.—I esteem it most efficacious on tobacco and clover, though its effects are great on all kinds of grass, grain, and plants.

Q. 3.—When is the time, and how is the plaster applied?

A.—It is almost the universal practice with the Loudoun farmers to roll all kind of seeds in plaster; even potatoes cut and plastered, produce more abundantly. I soak my seed wheat for twenty-four hours, in strong brine, and, after draining it, roll it in plaster, at the rate of a peck to a bushel of wheat. As soon as the wheat branches in the fall, I strew a bushel of plaster to the acre, and in the spring, immediately after sowing my clover seed, I strew an equal quantity of rotten or leached ashes and plaster to the acre, say an half bushel of each. I soak my seed corn for twenty-four hours in strong manure water, and when dropped in the hill, throw the half of a table spoonful of dry plaster on the corn before it is covered; the usual practice is to roll the corn in plaster before planting, and to drop the plaster on the young plant, after the first hoeing, or to strew it broadcast over the whole field. I greatly approve of *fall plastering of wheat*, and am confident in my first experiment, I more than quadrupled my crop from a field of twenty acres.

Q. 4.—When is the best time of applying it to clover and other grasses?

A.—It is best to commence early in the spring; and as plaster is of a capricious nature, its application in small quantities, say an half bushel or less to the acre, and frequent repetitions, is most efficacious.

Q. 5.—Is it a current opinion in Loudoun, that there is any thing peculiar to the soil of that county, which favors the effects of plaster?

A.—It is not; as it is a well known fact, that the effects of plaster are equally great in neighboring counties. It is believed, that the renovation of the soil, by the application of plaster, has been more rapid between the Cotocton and Blue Ridge mountain, than any other part of this county. This embraces a country from twelve to fifteen miles wide, and about thirty miles in length.

Q. 6.—When is the time for sowing clover seed?

A.—Our farmers are governed much by the weather, in sowing their clover seed; some sow in the fall, but most of them in the spring, upon

wheat, rye or oats. They have their favorite months—many of them sowing in all three of the months of February, March and April. Some prefer sowing the seed when the ground is covered with snow, as it can be seen whether the seed is strewed evenly.

Q. 7.—What is the manner of sowing clover seed?

A.—The most of our farmers sow the seed broad cast, as they do turnip or any other kind of small seed. I have seen a box used for sowing clover seed that answers extremely well. It was invented by Mr. Bordley, of Maryland, and consists of a box seven feet long, five inches wide and three inches deep, made of light half inch boards. The box is divided into seven parts, each division having two holes bored through the bottom, half an inch in diameter and placed diagonally. Square pieces of strong writing paper are pasted over the holes, on the inside of the box. A hole is burnt with a coarse knitting needle through each paper. At about a third of the distance from each end of the box, were fastened strong leather straps, by which the box was held, and a little agitated in carrying before the seedsman, walking along the lands.

The Pennsylvania farmers sow in the proportion of a bushel of clover seed to eight acres of land. Our proportion is a bushel to ten or twelve acres, when it is intended for hay or seed; when for pasture, a bushel to twenty acres.

Q. 8.—What are the modes practised in Loudoun, for gathering and cleaning clover seed?

A.—The most common practice, is, to cut the clover with a scythe; and as soon as it is mown, to rake it into small heaps, and expose it in the field for several weeks, to promote the decay of the husk; these heaps are turned during wet weather. When the husks are sufficiently rotten, which may be ascertained by rubbing the heads between the hands, they are housed and thrashed or trod out by horses, during the cold dry weather in winter. It is then blown gently through a wheat fan, to separate the pug or chaff from the seed. The seed and chaff are sown separately; but as a large proportion of the seed will always remain in the chaff, the field sown with the chaff is generally thickest set with clover. Some of our farmers make use of a machine invented in New York, which is very simple in its construction. The machine is drawn by one horse, and is guided by a man or boy. It consists of an open box, about four feet square at the bottom, and about three in height on the two sides and back part; the fore part is open, and has fingers fixed to it, either of hickory or steel, like a comb, about thirteen inches long, and so near as to break off the heads from the clover stalks between them, which are thrown back into the box as the horse advances. The box is fixed on an axle-tree, supported by two small wheels, two feet in diameter. Two handles are fixed to the hinder part, by means of which, the driver, while he manages the horse, raises or lowers the machine, so as to take off all the heads of the clover. It is the second crop of clover that is saved for seed, that is of the same year; and when saved for seed, the heads should be quite brown or dead ripe.

Q. 9.—What is the mode of curing clover hay?

A.—When the half or more of the clover heads are turned from red to brown, and on the decay, it is the right time to mow it. Some make clover hay, by following the mowers, and spreading the swarths as soon as the dew is off, and making it up into cocks before night—some make it into cocks immediately after the mowers. It is a hay that requires great attention in curing, as the heads and leaves will bear little stirring without crumbling; it is therefore best to rake it after the dew falls in the evening. The hay is put into the stack or barn the day after it is mown, and to secure it from becoming over-heated or mildewed, some sprinkle salt alternately between each layer of hay, which, assimilating with the juices of the hay, prevents too great a fermentation. Some put a layer of straw between, load and load of it. The straw contracts so much of its moisture, that the cattle eat it very freely. Where straw or salt are not used, it is usual to make a funnel in the centre of the stack to admit the air. This may be simply done, by placing or leaning five or six rails against a centre pole, to stack the hay around.

Q. 10.—Is clover much used for raising hogs?

A.—It is: and our farmers are making it a profitable business. The hogs are turned in when the clover is in blossom, and thrive exceedingly on it. They graze without attempting to root. The average quantity of corn allowed in former times to make a hog good bacon, was two barrels; since the introduction of clover, a barrel, and sometimes less, is found sufficient.

Q. 11.—Is deep ploughing much practised?

A.—It is: and has done as much in my opinion, to improve the soil of Loudoun, as the clover husbandry, and plaster. We seldom use less than three, frequently four, and sometimes five strong horses in a plough, and plough as deep as the plough and the strength of the horses will admit. Mr. Arthur Young, by attending particularly to the depth of ploughing in various towns in England, found that the average depth in sandy soils was four inches, in loamy soils four and three quarters, and in clayey soils, three and an half. In Loudoun, we plough much deeper; sometimes not less than ten or eleven inches. Great regard is paid to the situation of the land, by our best farmers; they never plough when the land is so wet that it will not easily crumble; because the principal design of ploughing, is to break the cohesion of the soil; and, if in ploughing, you turn over a wet mass, the ploughing can be of no advantage, as the soil becomes no lighter or looser by it, but rather heavier and more compact. Regard is also had to the shape of the land, by ploughing the hills horizontally, and making the furrows as nearly parallel to the base as possible. Owing to this mode of ploughing, it is rarely that you now meet with a gully.

Q. 12.—At what time of the year is the land broke up deep?

A.—We plough deep for all kinds of crops. For corn and oats, we break up our land early in the spring or late in the fall. When the land is broke up for corn in the fall, we often plough it in the spring, and cross running a heavy harrow over it, either lay it off from three and an half to four feet each way, or in drills, from five to eight feet wide, and plant the corn from twelve to eighteen inches apart. The deep ploughing not only retains the moisture from rains and dews, prevents gullies by absorbing the water, but buries

the roots and seeds of the weeds so effectually as to require but little cultivation for the corn; a common light harrow run over the corn when it is about six inches nigh, and one ploughing with a hoe, harrow, or cultivator, will be sufficient. From such a system of cultivation, I have, this year, made from a large field, more barrels to the acre, than it would have produced bushels of corn, eight years ago, when I purchased it, and there has not been five cart loads of manure on the field since it came into my possession.

Q. 13.—What course of crops are generally pursued in Loudoun?

A.—I believe the five year's rotation is the most common; that is, corn, wheat, clover, clover, wheat. The most productive and improving rotation in my opinion, is the six year's rotation; that is, corn, wheat, clover, clover, wheat, clover. By this rotation, one sixth of the plough land will be in corn, one-third in wheat, and one-half in clover every year. Each field is to be cultivated in corn, once in every six years. The following is an illustration of the whole round of crops during six years:

Number of years.	Number of Fields. 1	2	3	4	5	6
1	corn	clover	wheat	wheat	clover	clover
2	wheat	wheat	clover	clover	corn	clover
3	clover	clover	corn	clover	wheat	wheat
4	clover	corn	wheat	wheat	clover	clover
5	wheat	wheat	clover	clover	clover	corn
6	clover	clover	clover	corn	wheat	wheat

The corn, when in the proper state for topping, is to be cut down with a knife or hoe, and to be set up in rows, as you would tops; the field is then broke up in lands from eight to ten feet wide, the wheat sowed on it and harrowed in. A part may be sown in rye, or reserved for oats and flax in the spring.

Q. 14.—Is wheat put in on clover-lays or fallow, and which is considered the best method?

A.—The clover-lay answers very well where the land is clear, and well taken with clover, as it saves the expense of cross-ploughing. The seedsman follows the plough, and the harrow the seedsman. The clover lay is very common, both with the red and the white clover; but requires the land to be very well taken with clover and no blue grass, or the crop will be greatly injured or entirely destroyed. I consider the crop more certain when the land is broke up from the 20th of June to the 20th of July, and cross-ploughed before seeding.

Q. 15.—What was the state of the soil before the plaster and clover husbandry were applied?

A—The land, which was not originally of the first quality, was worn out by long cultivation, and bad systems. Some of our most productive farms, at this day, were sold very low by their owners, who could not support their families on them. Land that produced not more than five bushels of wheat and two barrels of corn to the acre, before the introduction of the plaster and clover system, will now yield from forty to fifty bushels of wheat, and from ten to fifteen barrels of corn to the acre.

Q. 16.—What is the growth of the forest and wood land?

A.—The usual growth, is white oak, black oak, red oak and hickory, with a mixture of poplar, locust and some little walnut, when the land is of the first quality.

Q. 17.—What are the effects of plaster on tobacco?

A.—The effects of plaster on tobacco are greater, in my opinion, than on clover; and I am well satisfied there is but little clover land in this county that would not produce good tobacco, with the assistance of plaster. My first experiment with plaster, was on tobacco, about twenty years ago. My father gave me an estate, on which wheat, corn and tobacco had been cultivated for many years. The overseer had a few acres in tobacco, at the time I took possession, one-half was wed out before harvest: the crab grass had taken entire possession of the other half, before we could spare labor from the harvest field, to weed it out. The tobacco last wed had a yellow, sickly appearance, while the other part was in a flourishing condition. I caused a small quantity of plaster, (say the half of a table spoonful,) to be dashed on each plant of tobacco last wed. The plaster acted like magic—the tobacco revived in a few days, and in a few weeks was equal to the other, and finally surpassed it. I invited several of my friends to view it, who could perceive the difference at more than one hundred yards distance. The next year, I caused a piece of ground that had been in cultivation for many years, to be prepared for tobacco. This land had been of the very first quality, but reduced by our old system of cultivation. The tobacco was planted in good season, without one shovel-full of manure, and after the first hoeing or weeding, it was planted after the manner before described. The growth was uncommonly great, beyond my most sanguine expectations. It was believed by judges that every two plants would have made a pound. This was my last experiment with tobacco, as I have not cultivated the plant since. A very intelligent neighbor of mine, made some experiments at the same time, and on the year following: the result of his experiments were the same with mine. From these experiments, I would recommend to you the following system, and will vouch for its success. Take four lots of land, each equal to the number of acres you wish to cultivate in tobacco, and observe the following rotation: tobacco, wheat, clover, clover. By this rotation, one-fourth will be in tobacco, one-fourth in wheat, and one-half in clover.

The following is an illustration of the whole round of tobacco crop, for four years:

Number of years	Number of Lots. 1	2	3	4
1	tobacco	wheat	clover	clover
2	wheat	clover	clover	tobacco
3	clover	clover	tobacco	wheat
4	clover	tobacco	wheat	clover

The clover field in course, to be cultivated in tobacco, should be broke up deep, late in the fall, and during the dry and frozen weather, all the stock should be fed on it. By pursuing such a system as this, I feel confident you have no land that cannot be reclaimed so as to produce more tobacco at the end of one rotation, than it did in its original state.

Q. 18.—What kind of plough is most used in Loudoun?

A.—The most approved plough, is one made in this village, by a Mr. McKinzie. It has an arched or crooked beam, to prevent its choaking in clover or foul land. The mould-board is much upon the principle of the Jefferson mould-board, as are the Peacock, Chenoweth and Freeborn patent ploughs. We have several very good plough makers in this county, all of whom use cast-iron mould-boards, made from their own patterns. The Freeborn plough of New York, is highly recommended, and will suit your land. It can be had in any of the seaport towns.

Q. 19.—What kind of harrows used?

A.—There has been but little improvement on the harrow. The square harrow is the most common. Each farmer has two or more harrows, light or heavy, to suit the ground or purposes for which they are used.

I have endeavored, in a hasty manner, to answer your inquiries on the subject of Loudoun husbandry. Should I not have been sufficiently explicit, or should you, or the society, of which you are so zealous a member, wish further information, it will give me great pleasure to impart any knowledge I may have gained from my own experience, or the experience of my neighbors.

I am, with sentiments of
Great respect, yours,
WILLIAM NOLAND.

George W. Jeffreys, esq.

THE PERSIMMON TREE.—*Diosphyros Virginiana.*

To the Editor of the Farmers' Register.

I am somewhat surprised, that the persimmon tree of Virginia has not attracted more general attention. It is certainly one of the most valuable trees we have, being a great annual bearer of quick and vigorous growth, producing fruit from the seed in four years, attaining great age, very hardy, and subject to no disaster. This tree, according to the Linnæan system, belongs to *Polygamia Dioecia.* persimmon trees are in pairs, each bearing flowers, male and female. The fruit is not found in perfection beyond the 40th degree of north latitude: hence, we find southern persimmons in great demand, when offered for sale in northern markets.

I will now give a synopsis of this tree, as far as it has come under my observation. First, the

Bark.—The bark of the persimmon tree, makes a permanent and lasting dye, with saline and metallic mordants; with alum, a beautiful yellow is obtained. The extract of the bark, rubbed down with olive oil, stands highly recommended in chronic inflammation of the eyes. When pounded, and given in doses of a tea-spoonful or more, it cuts short the period of intermitting fever. It is also used in ulcerous sore throat.

The Leaves and Flowers.—The tender leaves, soon after they bud, if carefully gathered and dried in the shade, make an agreeable tea, not inferior in flavor to the coarser teas of China. The flowers also, when dried, make a pleasant aromatic tea.

The Ripe Fruit.—There is a great variety of this fruit, as great, perhaps, as we find among the apple. The best persimmons ripen soft and sweet, having a clear, thin, transparent skin, without any rough taste. This should be attended to by the cultivator, as it is highly important to have select fruit. A good ripe persimmon is a delicate nutritious morsel; most animals fatten upon them, the chicken, duck, turkey, goose, dog, hog, sheep and cow, all eat them greedily. The fruit, well mashed, and strained through a coarse wire seive, makes delightful bread, pies and puddings. When kneaded with wheat-bran, and well baked in an oven, the bread may be put away for winter use in making beer, and used when wanted.

The following I consider a good receipt for making persimmon beer:

Sweet ripe persimmons, mashed and strained,	-	1 bush. or 8 galls.
Wheat bran,	- -	½ bushel.

Mix them well together, and bake in loaves of a convenient size; break them in a clean barrel, and add 12 gallons water, and two or three ounces hops; keep the barrel in a warm room. As soon as fermentation subsides, bottle off the beer, having good long corks, and place them in a low temperature, and it will keep and improve for twelve months.

This beer, when properly made in a warm room, and bottled as above, is an exquisitely delightful beverage, containing no alcohol, and is, to the connoisseur of temperate taste, superior to the fermented juice of the vine. The persimmon contains much sugar, and I have no doubt, when a fair experiment is made, that it will be found to yield more sugar, in a given bulk, than the beet or pumpkin. Ripe persimmons may be kept through the winter in pots, having layers of dry sand, or strained and bottled.

The Persimmon Seed.—I have no hesitation in saying, that the seed of the persimmon is the best substitute for coffee, yet discovered. They should be parched in an iron vessel, until they become perfectly brittle, and ground in the usual way. A small cup full, boiled in one quart of water, makes strong coffee; those who like it weaker, may add more water. The persimmon coffee exerts a friendly influence on the whole system, particularly the head; respiration becomes free and easy, and pleasurable sensation is produced. The only disagreeable effects arising from its use, is a tendency to constipation of the bowels, if used in large quantities.

The Wood.—The wood of this tree is very valuable; it burns freely, with a steady, uniform heat: the only objection to it, is, that it consumes away, without leaving live coals. The ashes contain nearly as much potash as the oak. The wood of the persimmon is close, hard and white, inclining to yellow, having a fine grain, and receives a beautiful, shining polish. It is useful when manufactured into plane stocks, gun stocks, bed-posts, plough beams, mantel-pieces, handles for instruments, map-rollers, picture-frames, canes, fifes, flutes, flageolets, combs, &c. &c.

A tree, having so many peculiar advantages, ought to be cultivated by every farmer in Virginia. Two acres of ground in persimmon trees, would afford sustenance for hogs, and other animals, from October to January, three months. For a more particular account of this tree, I refer the reader to Dr. Benjamin S. Barton's 'Collections' part 1st, page 11th, and part 2d, page 52d. See also, Professor Woodhouse's 'Inaugural Dissertation' on this subject.

WILLIAM B. SMITH.

Cumberland, Dec. 12th, 1837.

For the Farmers' Register.

MOLASSES AND SUGAR FROM PERSIMMONS.

Dear Sir—Although, in this hobby-horse-ical age, every man who recommends a new thing, incurs the risk of being suspected to make a hobby of it, I shall venture to state to you two interesting facts, as I think them, relative to the persimmon: facts which are certainly new to me, although familiar to several old people, with whom I have lately conversed on the subject. I do this upon the principle, that if I—a sexagenarian, have been ignorant of this matter, until a few weeks ago—many—if not all younger persons—may be equally ignorant; and that the reverse of the law-maxim, '*de minimis non curat lex*,' should always govern the true friends of husbandry and political economy.

I had long known that the wood of this very common tree in Virginia, was equal to any firewood; that none was superior to it for making plane-stocks and shoe-lasts; that the inner bark makes a pretty yellow dye; that a good substitute for ink might be made of the green fruit and leaves; that the ripe fruit was greedily and most beneficially eaten by horses, hogs, cattle and sheep; that it would make beer, which, after being properly hopped and bottled, I prefer to any champaigne I ever tasted—much as the assertion may horrify our dandy-wine-bibbers—and that it would produce more brandy per bushel, than any other fruit—for it contains so much of the alcoholic principle as never to freeze—brandy too, which many deem equal to that distilled from apples or peaches. But it was a matter never even "dreamt of in my philosophy"—although I might have known it—that the two first runnings of the beer may be converted—by boiling down, in a copper-kettle, into very good molasses, at the rate of a gallon from less than a bushel of the fruit—and that the third watering of the casks would produce excellent vinegar for table use, although too dark for pickling.

In regard to its convertibility into molasses, I have had, within a few days past, not only *ocular*, but *palate* demonstration, (if I may so express myself,) for I have just tasted some of a bottle full—presented to me by a niece of mine, who is quite as great an amateur of farming and gardening as I am, with much more of the requisite zeal, ardor, and energy, than old men can possibly possess. To my taste, this persimmon-molasses is as good as any common cane-molasses, and so much like it, in every respect, that no person, I think, could distinguish the one from the other, unless previously told which he was tasting. This sample has a slightly acid taste; but *that* is always perceptible in the common cane-molasses, where no lime has been used in the process of making it, to correct its acidity. After remaining some time in the vessel which contains it, I understand, from indisputable authority, that the persimmon-molasses deposites a substance precisely similar to that which we find at the bottom of hogsheads of the cane-molasses. This substance is—*sugar*, capable by purification—nay, *without it*—of being very useful and agreeable for common purposes, to our negroes; produced too, at a less expence than we incur in purchasing the lowest priced cane-sugar.

In by-gone times, I perfectly recollect, that, in clearing land, it was the universal practice to leave all the persimmon trees standing; and why they should now be extirpated from our fields, I cannot understand, unless it be to show our contempt for ancient usages. They certainly injure any crop which grows under them, less, (if at all,) than any other tree, while they will greatly over-pay that injury—even admitting it to be certain—by the various uses to which the wood and the fruit may be applied. These are so multiform, and would seem so marvellous, I think, to any one who had not heard of them before, as to be almost as incredible as the hoax, which I once heard a cute Kentuckian, that had been travelling "down east" in search of adventures, play off, upon a green-horn acquaintance from his native state, who had come as far as Washington, "*to see the world*," and pick up wonders to carry home. The hoaxer told him, that he had seen, in Yankee land, a late invention, called a *mutton machine*, into which, if a live, fat sheep were thrown, the fleece, flesh, suet, and horns, would, in rapid succession, be returned to you in ready-made broad cloth clothes, good soup, candles and combs. Yet the latter is a Baron Munchausen tale, while all that I have stated of the persimmon, can be verified by hundreds of perfectly credible witnesses. Perhaps the whole may be already known to you, who live in a persimmon country, and to many of your subscribers similarly located. But should you think that the facts will have any interest for any of them, you are welcome to make the foregoing statement in your next 'Register,' on the authority of your old friend,

JAMES M. GARNETT.

LIMESTONE DISCOVERED NEAR CHARLESTON, SOUTH CAROLINA.

[The following account is interesting, and deserves notice, for more reasons than the value attached to the discovery by the writers below. We infer, both from the locality of the rock, and the description and statement of its chemical analysis given, that it is not *limestone proper*, but a better thing, if rightly used—that is, a very rich concretion of fossil shells, or of their indurated remains, such as may be seen in the oldest formation of what is called "marl," in many places on the banks of James river. We attach but little value to this stone, as a material for paving streets, in its direct and designed object. It is obviously too soft to form a durable pavement. But if so used in Charleston, even its waste, as a pavement, will produce far more valuable effects, in combining with and locking

up for use as manure, all decomposing putrescent matters, which now act freely in producing disease, and which produce nothing else. When we recently published, in this journal, at much length, our views on this subject, we had struck off several hundred extra copies, for gratuitous distribution, and sent one to each of the mayors of all the considerable towns in the U. States. It would seem that our efforts on that head, as in many other attempts to act on the public mind, were totally thrown away, and have remained unnoticed by any of those authorities. We now see some faint prospect that the end proposed, may in Charleston, (as has already been done in Mobile) be produced, indirectly, if not directly, and in proper manner for economy and effect.

One of the most striking things to remark, in this account, is, that in treating of the discovery of so rich a material for manure, in a region that may be so much benefited by its application, neither the editor of the agricultural journal, nor the professor of chemistry, even so much as allude to the possible uses and value of this calcareous deposite, *as manure* for the soil. It is for this, its far most profitable use, that the softness of the rock adds to its value.

[Ed. Far. Reg.

From the Southern Agriculturist.

We cannot deny ourselves the pleasure of recording the successful exertions by our city authorities, to avail themselves of the geological resources of our own state. Within a few months, many thousands of bushels of shells, which for centuries, for aught we know, have been laying uselessly blanching and undergoing decomposition about our harbor, have, under their orders, been advantageously employed in filling up low places, raising streets, and forming side-walks. This, as may be supposed, has been attended with very considerable expense, as every bushel has cost the council from three to four cents, besides the cartage to the points requiring the shells.

We are now happy to learn from a correspondence between his honor, the mayor, and Dr. Hume, professor of chemistry, in the Medical College of South Carolina, that an apparently inexhaustible body of lime-stone, adapted to the permanent improvement of our streets, has been discovered within a very few miles of this city. As the subject-matter of the mayor's letter may be inferred from the reply by Dr. Hume, we publish only the latter, as affording all the information we possess on this interesting subject, except that we have learned from another source, entitled to credit, that the lime-stone has been offered our authorities at the low price of $2 50 per ton, deliverable at any point on the Ashley side of the city.

Ed. Sou. Agricul.

November 14th, 1837.

Dear Sir—I have received your favor of the 13th, accompanying a box, containing specimens of a rock, from Mr. Francis' plantation on Ashley river, which you request me to examine, and report upon, relative to its capabilities of improving the streets of the city.

It gives me pleasure to inform you that I have devoted myself to the examination of its physical and chemical properties, and am prepared to furnish all the information, which has been suggested by this examination. Simple inspection exhibits the rock to be a concretion of marine shells, most commonly in fragments, but many remaining sufficiently perfect for distinct recognition. Scattered throughout the mass, are small fragments of quartz, in the form of coarse gravel, distinctly visible to the naked eye, while other fragments, still smaller, require the aid of a lens to be seen. The external form of the nodules, for such they appear to be, is various, but in general they possess the irregular surface, which would naturally be supposed to arise from an aggregation of hemispherical bodies, such as shells usually are. The internal structure is clearly indicative of its composition. Its cohesion is variable, according to its moisture, for it is apparent that those specimens which were obtained from the bottom of the creek, are softer than those obtained on the surface of the dry land. Its hardness is less than marble, but greater than chalk. It is easily broken into fragments about the size of the component shells, but it is not easily reduced to an impalpable powder. When submersed in water, it does not fall to powder as the marls commonly do, nor does it become friable by excessive dryness. Chemical examination proves it to be of testaceous origin, for it yields, on analysis, 80 parts of carbonate of lime, 20 of silex,' (which is mechanically mixed) and a trace of iron and animal matter.

In answer to your several questions, I beg leave to reply, that I do not consider it to be sufficiently hard and firm, to resist the action of the wheels of heavily laden vehicles, nor even of lighter ones, when moving rapidly. It will certainly not be durable, if used as paving stones, for the percussion of the wheels will soon reduce it to fragments. I am induced to think that it could be advantageously used as a foundation for a road. If defended from the repeated blows and attrition of the wheels, there cannot be a doubt about its fitness and durability for improving the streets. It is certainly able to support the actual weight of the wheels, but it is too brittle to resist the percussion of the wheels.

The plan which appears to me to be most proper, is, to make a substratum of this limestone, thus securing a solid and unyielding foundation, over which may be placed smaller fragments of the same, or broken stones of greater hardness, or even shells, taking care in the arrangement of the strata, that the wheels are not permitted to strike directly upon the Ashley river lime-stone. If the surface of the road is level and smooth, percussion cannot take place, and of course comminution of the stone cannot occur, and the road will not be impaired. The principles of McAdam can be fully carried out with this stone, and it will prove beneficial, and the road will be durable, provided care is taken to repair commencing irregularities, and removing displaced stones which occasion jolts, and consequently pound the surface in spots, and produce the above mentioned irregularities.

I should suppose this material to be valuable for filling up holes, occasioned by mud-puddles; it would consolidate and form a smooth surface, which would not be again dug out in wet weather by the passing wheels.

In the emergencies of the city for materials for improving the streets, I cannot but think that this stone will prove highly valuable, and be an acqui-

sition to the city. In conclusion, I do think it advisable to bring to the notice of council the probably advantageous employment of this material for improving the streets, and to recommend that experiments be instituted to test its qualifications in a practical manner.

I do not maintain that this stone is exactly, nor admirably adapted to the purpose in question, but in the absence of better, it is deserving of notice. Lime-stones, in other countries, are not selected for road-making, because other and harder material can be obtained; but I remember upon the Salisbury plains, in England, I travelled upon an excellent road made of chalk! Similar roads I saw near Dover, and in France.

The stone in question is harder than chalk, possesses the same chemical composition, and is endowed with the property of consolidating by pressure, and cementing by the percolation of water through its interstices.

In the absence of other and acknowledged better materials, it is proper to experiment upon this, and I sincerely hope and confidently trust that success will attend your endeavors. If my suggestions are of any value to you, it will afford me pleasure, and if I can be of any assistance to you in furtherance of your laudable desire to improve the city, you are at liberty to command my services. In the mean time, I have the honor to be,

Very respectfully, yours,

WM. HUME.

The Honorable HENRY L. PINCKNEY,
Mayor of Charleston.

From the Buckeye Plough Boy.

IMPORTANCE OF AGRICULTURAL PAPERS,

Propriety of legislative aid being granted to Agricultural Societies; importance of rotation of crops, &c.

North Bend, Oct. 28th, 1837.

Dear Sir,—I duly received the first number of the Buckeye Plough Boy, which you was good enough to send me. I should have made this acknowledgment sooner, and requested to be placed on your subscription list, but have been prevented by sickness in my family, and pressing calls upon my time by my agricultural operations. I sincerely wish you success in your laudable undertaking to diffuse information upon the important subject to which you have devoted your paper. It is, however, true, (and I regret to say it,) that many of our farmers appear to be insensible to the advantages of such publications. I believe, however, that an improvement in this particular is gradually going on, and that the benefits which the agricultural interest derive from them will soon be generally felt and acknowledged. In this particular, some of our sister states east of the Alleghany ridge are considerably ahead of us, and a correspondent improvement in the management and product of their farms has been the consequence. The agricultural societies established in various parts of the states have done something towards correcting this inequality, particularly in the improvement of the domestic animals; and if our legislature would lend its aid, we might soon be able favorably to compare the character of our husbandry with that of any of the states. The state of New York allows to each of their county societies a sum equal to what they receive from private contributions. In France the government bears all the expenses of a society established in that capital, with ramifications in every part of the kingdom. It is under the patronage of this society, established by Napoleon, that the cultivation of the sugar-beet has been so widely extended to the great benefit of this nation. Ohio has appropriated large sums to the construction of canals and roads for facilitating the transportation of the products of agriculture to market. I can see no reason why they should not do something towards increasing the quantity and improving the quality of those products. Our agricultural societies are most of them in a languishing state, and without legislative aid many of them will, unquestionably, discontinue their operations. Appropriations of this kind are like those which a farmer makes in fertilizing and improving his soil, adding frequently to his income an hundred-fold. Thus it is with an expenditure from the treasury for improving the products of husbandry; the wealth of the people being increased, they will be enabled to return those advances, with immense interest, whenever the exigencies of the government may require it. The agricultural products of Ohio are, indeed, very considerable, but this is due more to the bounty of Providence in having furnished us with so fertile a soil, than to the character of our tillage. Many of our farmers seem, indeed, not aware of the extraordinary results to be produced by a judicious course of tillage, and how soon a naturally poor soil may be eminently productive, whilst one naturally rich, may be brought down in its yield to the standard of the poorest, by bad management. In England innumerable instances of the former constantly occur; and the process by which it is effected being disseminated through the country by means of the agricultural societies, and the periodical publications supported by them, the number of such instances are constantly increasing, whilst with us the eye of the traveller often lights upon fields whose products are diminished 50 per cent. from what they yielded when first cleared, by injudicious management. A single instance of what I have said in relation to England may suffice. The county of Norfolk has, perhaps, more poor land than any other in that kingdom, and it is not only poor, but sandy. In a district of this kind, Mr. Coke, celebrated for his constant support of the liberties of the people in parliament, as for his knowledge of agriculture, purchased a large tract of land. When it first came into his hands, he says, that there were scarcely any living animals upon it but rabbits, and they were in a starving condition. An American citizen, who has lately visited his seat, says, that he had, last year, between six and seven hundred acres in wheat and barley; and that the product of his fields was oftener forty bushels to the acre than under that quantity. Although various means were adopted by the sagacious mind of Mr. Coke, to effect the result, the bases upon which it rested was the cultivation of turnips. Upon such a soil, grass at first was out of the question; but, by much labor in the cultivation, turnips might be raised, and sheep be sustained by turnips. So the turnips fed the sheep, and the sheep *fed* the land; and in a short time the land was strong enough to bring both grass and grain. By a judicious management of these, the land was still further improved until

it reached the perfection above stated. But in nineteen-twentieths of our fine state all that is requisite is to keep the land in the condition in which we found it; and to do that, all that is necessary is to adopt a proper succession of crops. This alone will do, without the trouble and expense of manuring. All of our practical farmers know very well that the continued growth of the same kind of grain upon the same field will, in time, greatly impoverish it, and lessen the product; but that by alternating the various kinds of grains, good crops may be obtained for many successive years. Still the land will be deteriorated unless re course be had to manure, or some vegetable which will give to the land more than it takes from it. There are various articles which have been employed for that purpose; but, perhaps, the best of them all is red clover. This grass has proved one of the greatest blessings to the agriculturalists both of America and Europe. With the aid of this grass many farms in the Atlantic states have been brought from actual barrenness to become very productive. To accomplish this, however, plaster, lime, vegetable, or animal manure, are necessary. The Ohio farmer, however, wants none of these, at least none are necessary to keep up the natural fertility of his land. A crop of clover succeeding three successive grain crops, and remaining two years, will effectually answer the purpose, and the farmer, who follows this course, will deliver his land to his successor, after a forty or fifiy years use of it, in better condition than when he received it. Every good farmer knows this; but, unfortunately, many understand the theory who do not carry it into practice. Many, too, suppose that if they change the crop from corn to small grain of some kind or other, that they may then go back again to corn, without injuring the land. This is a mistake. The best of land will be injured in time by this process. The fact that a change of crops was necessary to produce a good yield has long been known; but the reason of its being so was never guessed at until the discovery of it lately by a French chemist. By a series of ingenious experiments this gentleman discovered that most vegetables (the farinaceous grains more particularly,) not only receive nourishment from the earth, through the agency of the vessels of their roots, but that they also by the same, or a different set of vessels, made a deposite of a substance in the earth, which remained there until taken up by the roots of *other* plants. This substance being convertible into food for a different vegetable, but not for that by which the deposite was made. This satisfactorily explains the reason why a good crop, (of wheat, for instance,) cannot be raised for a succession of years from the same field. If the land is remarkably strong, two and even three good crops, may be raised; the plants, in this instance, finding sufficient nourishment from the natural strength of the ground. But it (the ground) from the yearly deposite becomes at length so completely saturated with it, as no longer to afford the required nourishment, and the plants, of consequence, are weak, sickly, and unproductive. Seeds of another kind, however, committed to this same field will reward the sower with an abundant crop; and after the lapse of a few years, it will be again ready to receive another crop of wheat, the intermediate crops having exhausted the wheat deposite, and left others peculiar to themselves, which been taken up by the roots of the latter plants, are elaborated in their vessels, and formed into a suitable and wholesome nourishment. As I have remarked, however, although the white grain crops (corn, wheat, oats, &c.) may succeed each other for some years without greatly injuring land that is naturally of good quality, still it will be ultimately impoverished, unless some other crop is occasionally intervened, of a character altogether different. These grains, although essentially different in their qualities, and manner of growth, are still of the same class; and there must, of course, be a considerable coincidence in the character and support which they draw from the earth, and the manner in which it is converted into the farinaceous substance which is the common and essential part of the perfected grain in all of them. The plant, of all others, which seems best calculated to exhaust deleterious deposites left in the earth by the grain crops, and to form a fresh supply of food for them by the mysterious operations of its roots and vessels, is red clover. To make the most of this plant, as a renovator of the soil, it should be (as is the practice with good farmers) ploughed in after it has attained its full maturity. In this way it furnishes a large mass of vegetable manure, which greatly contributes to the fertility of the soil. But if this were all the good it does, it would do no more than ploughing in any other equally succulent plant. I contend, however, that it imparts to the soil a degree of fertility which cannot be accounted for from the rotting of its stalks, leaves, and roots after they are ploughed in, and that the mere *growing* of the article upon the ground adds greatly to its fertility. I do not know that any experiments have been made to ascertain the quantity of deposite made by clover, as was the case in relation to the farinaceous grains by the French chemist above referred to; but I am certain that any very careful observer of the effect of clover in improving the soil, will come to the same conclusion that I have; which is, that it possesses a fertilizing quality, which is totally independent of that which is given by the decay of its roots, stalks, and leaves. The best farmers, as I have said, plough in the clover when it is at maturity, or at least when it has attained a considerable part of its growth; but the greater part feed it down to the ground before it is ploughed, leaving nothing to be converted into manure for the support of the crop about to be sown, but the roots. Now the decay of these roots, in the ground, could not alone produce the great fertility which a two-years' growth of clover is known to give. Three years ago I sowed a field with clover, upon wheat, in February. It was remarkably fine, being half-leg high in September. It was fed down, and in the succeeding winter it was entirely killed by the frost. In the spring the field was ploughed up for corn. The roots of the clover were dry and withered, and would, of themselves, have given little or no assistance to the crop; but yet it was fine, and the land had evidently been improved by the clover. It is fortunate that the theory, which has been established in relation to the farinaceous grains, is true also, as to many of the noxious plants, and those most troublesome to the agriculturists; such as the common dock, the thistle, the dog-fennel, and the thorn-apple, or Jamestown weed. Some years ago a friend of mine, who was very desirous to rid

his farm of the first-mentioned plant, told me that he had cut up all the dock in the greater part of one of his meadows, leaving only a small part where it was so thick that there was no grass on it. To his astonishment, he found the next year that in this last mentioned spot all the dock was dead; whereas, a good deal of that which he had cut up, and, as he supposed, had extirpated, vegetated afresh. I was unable to account for it at that time; but the difficulty now appears to be of very easy solution. The spot, where the dock was thickest, had, no doubt, been growing there for some years, until the ground had become so saturated with its deposite that it could no longer find nourishment to support it, and, therefore, died. Ten years ago, the thistle, that "votress of the gales," as Darwin calls it, was unknown in this part of the country. But it soon came to us in clouds "borne on broad wings," and created the apprehension that it would take entire possession of our pastures and meadows. I began to make war upon it, as my friend did upon the dock; but I found it lasted but a short time, always disappearing after the second year, from the spot where it had been previously thickest, although the ground was covered with its seeds.

I could add many more facts to confirm the theory I have supported, but have already written enough to tire your patience.

Accept my best wishes, and believe me with great respect, your humble servant,

W. H. HARRISON.

Dr. R. Fry.

From the Asiatic Journal.

HUMAN FOOD.

When man is considered with reference only to his intellectual part, it is not without reason that he is styled by Shakspeare, "the beauty of the world—the paragon of animals." A being, that is able in some degree to scan the work of creation—that can measure the globe on which he lives, and calculate the motions of the mighty orbs which roll in the immensity of space—that has subjugated the elements to his use, and made fire, air, and water his vassals, may be said to be, "in apprehension, like a god." To bring down our admiration of this "paragon," to a juster standard, however, it is unnecessary to enter upon an estimate of his moral imperfections—the specks which darken and disfigure the brightness of his undertaking—it is sufficient to contemplate him in his animal character, in order to see how nearly, with all his intellectual pretensions, he is allied in habit to the brutes. How mortifying is it to human vanity, to think that there is scarcely any species of matter, animal or vegetable, in any state of immaturity or corruption, which is not eaten by the human animal, and capable of assimilating with his substance, and thus forming an integral part of the compound machine of mind and matter called man! Mr. Donovan in his treatise on domestic economy, has devoted a portion of the last volume to the subject of human food, and has enumerated the various substances, animal and vegetable, which constitute, or have constituted it, amongst different nations. A more disgusting catalogue it is scarcely possible to read.

In his "account of animals used as food by the various nations of the world," he finds it convenient to arrange them in a natural order, beginning with man himself. It has been long doubted, he observes, whether human beings could feed on their fellow-creatures for the mere sake of the flesh, without any other incentive; but it has been incontrovertibly established, that man will devour man as his ordinary food, and often with a higher relish; that feasts of human flesh are resorted to as sources of animal gratification; that the cannibal has not only his favorite parts of the human body, but prefers certain modes of cookery. Our own ancestors were of the number of these horrible epicures. Diodorus Siculus charges the Britons of Iris with being anthropophagi; and St. Jerome (who lived so late as the fifth century of the christian era) accuses a British tribe, from his own personal knowledge, not only with a partiality for human flesh, but a fastidious taste for certain delicate parts of it. Not only in the Polynesia, but in Africa, human flesh is still consumed as ordinary food; and Stedman states that, in the interior of the African continent, human limbs are hung up on shambles for sale, like butchers' meat in Leadenhall market.

This is revolting enough; but it is little less offensive to consider the other animal food, which serves to allay the undistinguishing voracity of man. Monkeys are esteemed delicate eating; the Chevalier de Marchais says, that in South America, monkey-flesh is allowed to be nourishing and very delicate. The heads are made into soup, and are served with it; and although a person at first experiences some difficulty in accustoming himself to see heads which resemble those of little children; when this repugnance is once conquered, he finds that monkey-soup is as good as any other." Amongst other animals, the following are eaten in different parts of the world; bats and vampires, the sloth, the rhinoceros, the elephant, the seal tribe, the dog, the wolf, the foul jackall, the voracious hyæna, the rank fox, the fœtid skunk, the cat, the rat, the hedgehog, the camel, the horse, the ass, the tiger, the lion, the whale, the shark, the crocodile, lizards, frogs, the *boa constrictor* (which is perferred by the negroes, to any other food), the rattle-snake, the viper, or adder. Mr. Donovan might have added to his list of nations who are serpent-eaters, the Chinese, who fatten snakes as we do oysters, for the table.

More discrimination appears to be used in the insect tribe. A peculiarly disgusting insect is eagerly devoured by the Chinese and Hottentots; caterpillars are cooked into a dish in some parts of Australia, and the people of New Caledonia eat spiders. Ants and their eggs are eaten by several nations, and this kind of diet has been eulogized by Europeans who have partaken of it. In some parts of the East Indies, it is said that vast qantities of termites are collected and made with flour into a variety of pastry; but an inordinate use of this food occasions colic, dysentery, and death. Mr. Smeathman states that the Africans eat these ants roasted by handfuls, and several Europeans have declared that they are most delicious—like sugared cream, or paste of sweet almonds. Locusts are eaten in almost all the countries where they appear, either fried, pounded with milk, ground into flour, and baked into cakes, or made into soup.

Of fishes and birds, there appears to be scarcely any species excluded; and Mr. Donovan observes that, "although particular animals have been reported by travellers to constitute the food of nations whose history they write, we might perhaps extend the catalogue to all living creatures, with the exception of a few that are known to be actually poisonous."

The object of Mr. Donovan was merely to detail those articles which were the ordinary food of large classes of men. But there are many, of a disgusting kind, which he has not thought it necessary to notice, which are the ordinary aliment, or delicacies, amongst nations. The Cochin-Chinese are fond of hatched eggs, the Chinese and other eastern people, of putrid eggs. There are nations of dirt-eaters—the Ottomacs, for instance, who diet upon clay. Worms, grubs, and maggots are the food of others. The Dyaks and Battaks of Sumatra and Borneo drink human blood. Raw blubber is prized by the Esquimaux, and game in a state of putrefaction gratifies the palate of the polished European gourmand.

When we select instances of peculiar and depraved appetite, they are disgusting indeed. We have seen individuals in Europe who can devour vast quantities of raw liver, tallow candles, and tobacco-pipes; but what are they to the eaters of carrion, putrid offal, and excrementitious substances amongst the religions ascetics of India!

Perhaps the most repulsive, as well as prodigous, instances of outrageous voracity, is the sheep-eater of Oude, described by General Hardwicke, in the '*Transactions* of the Royal Asiatic Society.' This man, or rather monster, in the presence of several gentlemen and *ladies*, ate, at one meal, two sheep, one weighing from twelve to thirteen pounds per quarter. His mode of devouring the animals was this. He seized the live sheep by the fleece with his teeth, and lifted it from the ground; then by a swing of his head flung it on its back upon the ground. In this position he held the animal down, pulling the legs apart with each hand. He then tore the abdomen with his teeth, by stripping off the skin from the flank to the breast, removed the intestines, and buried his head in the body to drink the warm blood, which clotted round his hair and beard. He next stripped off the rest of the hide, separated the joints, and, rubbing them in the dust, tore the meat from the bones, swallowing one mouthful after another with all the dust and dirt adhering to it, laying aside the ill-picked bones for his supper!

The cruelty which this indiscriminate voracity of man inflicts upon the inferior animals, is frightful. The horrors of the Roman kitchen are detailed in Mr. Donovan's book. Vitellius and Heliogabalus regaled on a dish composed of the tongues and brains of peacocks, the bodies being thrown to the hogs. The combs torn from live cocks were a dish of exquisite relish to the latter, because seasoned with cruelty. The heads of parrots were served up at his feasts. Vitellius had a large silver dish, the filling of which, for one of his entertainments, occasioned wholesale slaughter, being composed of insignificant parts of various small and rare birds and fishes. Vedius Pollio, a gentleman of Rome, and a favorite of Augustus Cæsar, contrived a method of giving a flavor to lampreys, which all his friends, and Augustus himself, highly relished, whilst a secret; it was by feeding them on human flesh! One Claudius Æsopus, a tragedian, was renowned for serving up, on a large platter, worth £4,800, all kinds of singing and speaking birds. At a feast given to Vitellius, by his brother Lucius, there were 2,000 different kinds of fish, and 7,000 of birds. The celebrated Apicius expended nearly a million sterling on his kitchen, and finding his property reduced to only £80,000, fearful that he should starve, he took poison. A small dish of his, called *minutal apicianum*, or 'Apicius's Mince,' is made up of the excerpts of three or four dozen animals. But cruelty in the kitchen did not cease when Apicius administered to himself the salutary draught. His successors have caught his spirit. Dr. Kitchiner quotes from Wecker's '*Secrets of Nature*' "How to roast and and eat a goose alive." The goose, after being plucked, is to be surrounded by burning fuel, and cups of water are to be placed within the circle: "she is to be larded and basted; but she is to be roasted slowly. By walking about, and flying here and there, being cooped in by the fire that stops her way out, she will fail to drink the water, and cool her heart: and when she roasteth and consumes inwardly, always wet her head and heart with a wet sponge; and when you see her giddy with running, and begin to stumble, she is roasted enough. Take her up, set her before her guests, and she will cry as you cut off any part from her, and be almost eaten up before she is dead: *it is mighty pleasant to behold!*"

After reading this, what a satirist does Shakspeare seem, in the passage from which we quoted at the beginning!

ARTHUR YOUNG'S OPINION OF THE USUAL PROCEDURE OF AGRICULTURAL SOCIETIES.

Extracts from 'Travels in France.'

Went to the Royal Society of Agriculture, which meets at the *Hotel de Ville*, and of which being an *associé*, I voted, and received a *jetton*, which is a small medal given to the members, every time they attend, in order to induce them to mind the busines of their institution; it is the same at all Royal Academies, &c., and amounts, in a year, to a considerable and ill-judged expense; for what good is good is to be expected from men who would go only to receive their *jetton?* Whatever the motive may be, it seems well attended: near thirty were present; among them Parmentier, vice-president, Cadet de Vaux, Fourcroy, Tillet, Desmarets, Broussonets, secretary, and Creté de Paliuel, at whose farm I was, two years ago, and who is the only practical farmer in the society. The secretary reads the titles of the papers presented, and gives some little account of them; but they are not read unless particularly interesting; then memoirs are read by the members, or reports or references; and when they discuss or debate, there is no order, but all speak together, as in a warm private conversation. The Abbé Raynal has given them 1200 liv. (52l. 10s.) for a premium on some important subject; and my opinion was asked what it should be given for. Give it, I replied, in some way for the introduction of turnips. But that they conceive to be an object of impossible attainment; they have done so much, and the government so much more, and all in

vain, that they consider it as a hopeless object. I did not tell them that all hitherto done has been absolute folly; and that the right way to begin, was to undo every thing done. I am never present at any societies of agriculture, either in France or England, but I am much in doubt with myself whether, when best conducted, they do most good or mischief; that is, whether the benefits a national agriculture may by great chance owe to them, are not more than counterbalanced by the harm they effect; by turning the public attention to frivolous objects, instead of important ones, or dressing important ones in such a garb as to make them trifles. The only society that could be really useful would be that which, in the culture of a large farm, should exhibit a perfect example of good husbandry, for the use of such as would resort to it; consequently one that should consist solely of practical men; and then query whether many good cooks would not spoil a good dish.

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* * * At noon, to the society of agriculture (called the Patriotic Society), which fortunately for me, who am a member, had a meeting to-day: the Marchese di Visconti in the chair, with ten or a dozen members present, to all of whom Signore Amoretti introduced me. I never expect much from societies of this sort; but this of Milan was to-day employed on a button and a pair of scissors: it seems they want at this city to make the finer sorts of hardware, in order to rival those of England, and lessen the import, which, in spite of every obstacle, is very great: the idea originates with the government, and is worthy of its little ideas; a true peddling spirit at present throughout Europe. An artist in the town had made a button and half a pair of scissors, one half English and the other half of his own manufacture, for which he claimed and had a reward. Similar are the employments of societies every where! In England, busied about rhubarb, silk, and drill-ploughs: at Paris, with fleas and butterflies; and at Milan, with buttons and scissors! I hope I shall find the *Georgofili*, at Florence, employed on a top-knot. I looked about to see a practical farmer enter the room, but looked in vain. A goodly company of i Marchesi, i Conti, i Cavalieri, i Abati, but not one close clipped wig, or a dirty pair of breeches, to give authority to their proceedings.

From the Journal of the Franklin Institute.

DAVENPORT'S ELECTRO-MAGNETIC MACHINE.

[The following remarks by the editor of the 'Journal of the Franklin Institute,' are appended to the specification of the patent, in the last number of that publication. It is gratifying to know that so favorable an opinion is entertained of this discovery, by so competent a judge.—ED. FAR. REG.]

The subject of the foregoing specification is one of great interest, and it has arrested a corresponding portion of public attention; we are likely soon, therefore, to have the question solved, whether this new power can be advantageously applied to the propelling of machinery as a substitute for the steam engine. Most of our readers it is presumed, have seen Professor Silliman's notice of Mr. Davenport's machine, published in the Journal of Science, in April last, which contains much information respecting the attempts which had been made for the producing of motion by electro-magnetic apparatus. Since that period, advice has been received from Europe, showing that experiments upon this subject are in progress under the direction of some of the most distinguished philosophers in various portions of that quarter of the globe.

We do not know by whom, or at what date, the first successful experiment of producing a direct rotary motion, by the electro-magnetic apparatus, upon a principle analogous to that upon which Mr. Davenport has proceeded, was performed. As early, however, as June, 1833, an article appeared in the London Mechanics' Magazine, proposing such an apparatus, and giving a figure of one which, it was supposed, would answer the purpose; a supposition which was, undoubtedly, well founded. Not long after this, Mr. Saxton, we believe, produced a rotative machine by electro-magnetism, but we are not informed respecting its particular arrangements.

The history of the production of the machine patented by Mr. Davenport, is a history of the successful efforts of an individual, who to an indomitable perseverance, must have superadded, extraordinary natural abilities. His business is that of a blacksmith, and his advantages in point of education were not greater than usually falls to the lot of persons in country places, engaged in such pursuits. Accident brought to his notice, one of Professor Henry's electro-magnets, which he eagerly purchased, under a conviction that he could render it available as a motive power; this was in the year 1833, and in July 1834 he had so far succeeded as to produce a rotative machine, and this he effected in a country village, unaided by scientific knowledge, by books, or by the encouragement of men of superior attainments, or with kindred spirits. Whatever may be the final result of his labors, his merits are of high order, and he has proved himself well worthy of the most splendid success. Should his machine finally accomplish that which he and many of his friends anticipate, its values will be incalculable, for although he may have been superseded in Europe, his claim as inventor, will undoubtedly prove valid in his own country, and ambition need not carry him beyond it. We have twice seen his machine in operation, formerly in New York, and recently in Washington, where it was exhibited to the President, and the Heads of Departments. So far as the evidence of a model is to be taken, its performance is quite satisfactory; and Mr. Davenport is now occupied in constructing one which is intended to drive a Napier press, requiring a two-horse power. This, should it succeed, will be a fair test of its value, and we confess that, although our expectations do not generally partake of the sanguine in such matters, not only our hopes, but we may say our confidence has increased as we have become acquainted with the progress of the experiments which are being carried on.

We are well aware, that should it be eventually proved, that an available power may be obtained, which may be substituted for that of steam, its adoption would depend entirely upon its economy, with respect to which we cannot have satisfactory data, until a machine of several horses power shall have been produced; the probability,

however, is, that the cost of operating the electro-magnetic apparatus, will be much below that of the steam engine.

From the Magazine of Popular Science.

THE PINE-APPLE PLANT AND ITS FIBRE.

This plant, which has hitherto been valued solely as ministering to the luxuries of the table, has lately had a new interest attached to it from the discovery of a fibre contained in its leaves, possessing such valuable properties, that it will, in all probility, soon form a new and important article of commerce.

This fibre is found, on comparison, far to surpass in delicacy of texture, those materials which now form the basis of our woven manufactures: of these the principal are silk, wool, cotton, and flax. Silk is a continuous fibre, often extending, without interruption, to the length of 1000 feet; viewed under the microscope, it is found to be perfectly cylindrical, beautifully smooth, glossy, and transparent. The best kind of prepared silk varies from one-seventeen hundredth, to one-two thousandth part of an inch in diameter. Wool, on the other hand, is a rough cylindrical fibre, which appears as if plated with irregular scales, the edges of which overlap each other; though invisible to the naked eye, its roughnes may be easily detected, by drawing a fibre between the fingers, in a direction from its end to its root. It varies greatly in both length and size, the diameter of very fine wool being from one-seven hundredth to one-twelve hundredth part of an inch. Cotton, being the down of a seed-pod, has peculiar characters, a thin continuous tube, presenting the appearance of a flattened and twisted cylinder, arising from the compression which the fibre undergoes before the opening of the pod: its diameter is about the thousandth part of an inch. Flax, in many repects, differs from the foregoing materials; a filament of silk, wool, or cotton, admits of no division, while, on the other hand, each filament of flax is a fasciculus or bundle of fine fibres, connected by a thin membrane, and the natural gluten of the plant. These fibres may be termed ultimate, as they admit of no further subdivision: they are cylindrical tubes, disposed parallel to each other, and having the appearance of innumerable joints; their diameter varies, in different flaxes, from one seven hundreth to one-two-thousand five hundreth part of an inch.

The fibres of the pine-apple plant are also disposed in fasciculi, each apparent fibre being an assemblage of fibres adhering together, of such exceeding delicacy, as only to measure from one five-thousandth to one seven-thousandth part of an inch in diameter; viewed under the microscope, they bear considerable resemblance to silk, from their glossy, even, and smooth texture. They appear altogether destitute of joints, or other irregularities, and are remarkably transparent, particularly when viewed in water: they are very elastic, of great strength, and readily receive the most delicate dyes. This last fact appears singular, when we bear in mind the resistance, if we may be allowed the expression, which flax offers to dyes. With much trouble, and long processes, flax will receive a few dark dingy colors; all light and brilliant ones it wholly resists, they do not enter the fibre, but merely dry upon it externally, and afterwards peel, or rub off—in short, it may be said to be *painted*, and not *dyed*.

The preparation of the pine-fibre is exceedingly simple. If a leaf of this plant be examined, it will be found to consist of an assemblage of fibres running parallel, from one extremity of the leaf to the other, embedded in the soft pabulum. All the process necessary is to pass the leaf under a "tilt hammer," the rapid action of which, in a few seconds, completely crushes it, without in the slightest degree injuring the fibre, which remains in a large skein, and then requires to be rinsed out in soft water, to cleanse it from its impurities, and be afterwards dried in the shade. So simple and so rapid is the process, that a leaf, in a quarter of an hour after being cut from the plant, may be in a state, fit for the purposes of the manufacturer, as a glossy, white fibre, with its strength unimpaired by any process of maceration, which, by inducing partial putrefaction, not only materially injures the strength, of flax, but also renders it of a dingy color.

The pine-plant abounds both in our East and West India possessions, and may be easily propagated from the crown; the offsets from round the base of the fruit, which often amount to upwards of twenty in number; and from the young plants which spring from the parent stem; its cultivation requires but little care or expense, and the plant is of such hardy growth, as to be almost independent of those casualties of weather, which often prove so detrimental to more delicate crops—it is one of those plants which nature has scattered so profusely through tropical regions, whose leave are thick and fleshy, to contain a large supply of nourishment, and covered by a thick glazed cuticle, which admits of so little evaporation, that many of the tribe will thrive upon a barren rock, where no other plant could live. From the large portion of oxalic acid which the leaves also contain, no animal will touch them, and they are, therefore, exempt from the trespasses of cattle, &c., indeed, no greater proof of the hardiness of the plant can be given, than the fact, that in many places where lands have been under tillage, and have afterwards been abandoned, and allowed to to return to a state of nature, the pine-apple plants form the only trace of former cultivation; every other cultivated plant has died away before the encroachmeats of the surrounding wood, while they alone have remained increasing from year to year, and have spread into large beds.

In adverting to the present state of our West Indian colonies, we cannot but think that the discovery of this fibre will prove to them a most valuable acquisition. The small amount of labor and capital requisite for the cultivation of the plant, its hardy growth, its abundant produce, the facility with which the fibre may be prepared from its leaves, the trifling cost at which it can be brought to market, and the value attached to it, as an article of commerce, by those manufacturers to whom it has been submitted, seen fully to justify the opinion that it is calculated to open a new source of wealth to the colonies, and become a staple and valuable article of British manufacture.

From the Cultivator.

MILDEW ON THE GOOSEBERRY AND GRAPE.

We find in Mr. Reed's communication a suggestion in regard to mildew on the gooseberry and grape, which in a measure corroborates the correctness of the opinions we have heretofore expressed on this subject. The suggestion is, that salt will prevent the mildew on gooseberries, and probably on the grape. A pint of strong brine, put at the root of each plant in the spring, he informs us, has not only prevented mildew on the gooseberry, but has restored to the berry, before diseased and diminutive, its original size. All we object to is the mystical mode of application. "The brine should be put on without stirring the earth," says the Rev. writer, "so as [not] to wet the roots, as in that case it kills the plant: but there is no danger if poured on the earth undisturbed." The plain English of which seems to be; that the saline properties of a strong brine, if brought into immediate contact with the roots, will not only destroy the seeds of the parasyte, for such we consider mildew, but the vitality of the plant itself—the undisturbed surface arresting a great portion of the saline matter, which is subsequently carried down, by rains, in moderate quantities. This prescription is based upon the theory that mildew, in the gooseberry and grape, is a parasytic plant, the germ or seed of which abides at the roots; that salt destroys the vitality of these germs or seeds; but that, when applied in excess, it also destroys the plant. The great object is, therefore, to graduate the remedy to the cure, and this would seem to be best accomplished by applying the brine in winter or early spring, when the plant is dormant, and not absorbing the moisture of the soil—or in a diluted form, when it is in the progress of growth. Partial experiments with the grape had induced Mr. Reed to believe that a like application of brine to the grape, would produce results alike favorable.

A REMARKABLE CASE OF DISEASED BRAIN IN AN OX.

Charlottesville, December 12, 1837.

To the Editor of the Farmers' Register.

* * * * *

The principal object of this communication is to bring to your notice an extraordinary case (to me at least) of disease in cattle. Early last spring, one of the work steers on my mother's plantation, was discovered to be affected with what was supposed to be the common *hollow-horn*; and the usual simple remedies were applied, which afforded relief, so long as the horn was kept open for the discharge of the matter. I soon observed that the case differed in many respects from the ordinary disease before mentioned, inasmuch as when fresh bored, the horn bled profusely, and was not cold to the touch, &c. As the animal was in fine order, and eat freely, &c., he was kept at work several months, and finally turned into the pasture. In each case, whenever the orifice became stopped the animal soon manifested signs of great distress; but so soon as opened, instant relief was afforded, and great quantities of very offensive matter were discharged. The disease continued to increase, though every pains were taken to effect a cure; but still the ox continued to improve in flesh until a few weeks since—it being fine beef, and as winter was fast approaching, all prospect of recovery seemed to have become extinct—as it was evident from every appearance that the whole of one side of the head was affected—one eye havwasted away, and the matter running constantly from the ear. I determined to have him killed. On examination after it was slaughtered, it was discovered that one half the brain was entirely gone! And a piece of the skull in the face, two inches square, had also disappeared; one horn and one ear, were only sustained by the skin—the former being knocked off, when the animal fell. The other half the brain, and side of the head, were quite sound, as was every other part of the beef, which was very fat. I did not think it possible that an animal could sustain life after losing half, or indeed any part of its brain.

I am inclined to think the disease was produced by some injury sustained during the previous winter—probaby a shot, as several were found in the hide. I communicate this case, which appears so extraordinary to me, with the hope that you will be enabled to explain the phenomena, and suggest a remedy.

WM. TOMPKINS,
Editor of Advocate.

DIFFERENCE IN THE KINDS OF LIME FOR MANURE.

A correspondent desires to be informed whether it will be most profitable for him to buy and use stone-lime, or shell-lime, for manure. In answer, we say, the cheapest is the best; or that kind, of which a certain expenditure of money and labor, will serve to apply the greatest quantity of manure to the land. The comparison may be made between the two kinds, by weight, either before burning—when perfectly and recently burned—and before the commencement of slaking—or after slaking, but before any re-absorption of carbonic acid, which follows slaking very soon. But it will be very incorrect to compare any lime in one of these states, with some in another—as the weight is greatly increased by being combined with water, or with carbonic acid.

In this mode, which is safest and most correct, as a general rule, the materials for limes are supposed to be pure. This is never the case however; but the small and variable proportions of worthless matter, always contained in limestone, and generally among oyster-shells, will not materially affect the estimate; and their measure could not be precisely fixed, without a very accurate chemical analysis in every particular case.

For the Farmers' Register.

MOUNTAIN GRAZING FARMS. USE OF LIME IN FAIRFAX.

Fairfax County, Dec. 6th, 1837.

Mr. Editor—I enclose you $5—money, or shin-plaster, as you may please to call it.

After my wheat was thrashed and delivered, which was early in August, I gave myself a furlough for four weeks. In this time,

I passed through a part of Maryland, a part of our lime-stone valley, and some of our mountain country. The whole line of my travel, was through a blessed and noble country. Every thing like farming and crops, was marked critically; and I was the more watchful because of my expenses, that I might get as much information as would be worth the money expended. Since then, I have made an excursion into the mountain country, upon a short visit to some friends near Salem, in Fauquier county, much to my satisfaction and profit. No poet's fancy could imagine a more beautiful or healthy country. At a single glance of the eye, you see hundreds of fat cattle, feeding in rich pastures, or drinking of the pure stream which winds its way through the valleys like a thread of silver. Much of this country, as it should be, is devoted to grazing. It is too precipitous for the *free* use of the plough. Wash, however, as it may, under careless cultivation, it is easy to see that the plough brings up as good land, as the floods had previously swept away. I must believe that those hills are as old almost as mother earth; else why should they be *so rotten ripe*, so admirably fitted for the production of bread and grass? Compare them with the plain, from the base of the hills to tide-water, and what a meager result you have! The one, from its *constitutional combinations*, indestructible—the other, young, and in its very callow-feather, having neither constitution nor *skin*, that can be wrought into valuable uses for man or beast. But, sir, permit me to return to the hills. I first visited the farm of Dr. Loughborough, who pursues a mixed business of farming and grazing: the latter particularly cla med my attention. His fat cattle were yet upon the fields, being daily fed with corn, but were soon to be sold. His stock cattle were also upon the fields, but soon to be taken into his barn, which is warm, and well constructed for feeding 150 head, two to a stall, each confined to an upright post, upon the opposite side of each stall. At the rear of the stalls, is a long, tight trough, to receive the urine and excrement; in front, for containing food, was a capacious trough. The cattle are fed upon hay, straw, corn-stalks, &c. &c., all passed through a cutting box, operated by horse-power. Such quantities are given, of this cut food, two or three times a day, as will keep them in thriving condition. The urine and excrement are taken every morning in carts to the field, and lightly spread upon grass or grain. It is not intended that the cattle shall ever leave their stalls before the clover begins to blossom. They receive their water, as often as wanted, from pipes communicating with fine, clear water.

Immediately adjoining, is the grazing farm of Mr. Baker, whose feeding establishment is yet more extensive. His arrangements are for feeding 300 head, in nearly the same manner. These are new things in Virginia, and well calculated to show that our march is onward. I confess that my mind was much perplexed in relation to cutting so much food; but when I came to results—when imagination saw two or three hundred tons of hay, and straw, and corn-stalks, reduced to an animalized batter—and that immediately returned to the land—I was absolutely overwhelmed. I became breathless from wading through rich crops of grain and grass, and was near forgetting to recommend to them a dressing of lime, of which they have a mountain. By the way, let me say, that I am suspected of insanity, upon the subject of lime. It has become a sacred and inviolable rule with me, to plough no land that is not previously limed. In this year I have limed more than 200 acres, and now have ten or twelve thousand bushels of shells in my yard, for winter and spring operations. It is laborious work to haul so many shells six or eight miles; but when I look at results, hard work becomes perfect play. My servants are as mad as myself, for they now think that nothing can be done without lime; and I am free to say, that without lime, I would not receive worn-out land as a gift. Your book upon "Calcareous Manures" will give you immortality, and your country, millions.

LIME.

From the Genesee Farmer.

HINTS ON MAKING PORK, DERIVED FROM EXPERIENCE.

Mr. Tucker—I have heard some farmers say, only give them hogs and corn, and they could make pork. This is true, perhaps; but two individuals with hogs and corn of the same quality and goodness, one will make the fattening of pork a profitable business, while with the other it will be a losing concern. This is owing to their different management; and as all farmers love to have some profit for their labor, I have arranged a few hints for the farmer, which you can dispose of as you please.

In the first place be careful to *select a good breed of hogs for your farm.* There is more difference in breeds of swine than most farmers seem to imagine, or I am very certain the long nosed, long shanked, forever restless animals that we so frequently see, would by common consent be banished from our farms and our pens. It is not saying too much, that one third of the feed required for a given quantity of pork is saved, when fed to the China or Berkshire swine, or a cross of these breeds, rather than the squalling skeletons that disgrace the very name of porker.

Do not delay fattening your pork till winter. All animals take on fat much more readily in a proper temperature; and with the hogs, this should be warm rather than otherwise. The greatest care will not make a hog as comfortable in January as in October, and the fattening will be in the same proportion.

Let your hogs be kept as quiet as possible. Some farmers adopt a mode of feeding, by which what is gained in eating, is mostly lost in travelling. Their peas or corn are fed to them from the field, some half or three quarters of a mile from the house; and the trough and pen to which they come for the wash of the kitchen or the refuse of the dairy being at the latter place, this distance must be travelled over some four or six times a day by the animal, to get his meals. This course may make healthy hogs, but it is not the best way to make fat ones.

Do not fear that cleanliness will injure your hogs. To be kept in good health while fattening, hogs should be permitted to come to the ground, or a substitute provided; but the idea that to make a hog fatten, he must be permitted daily to case over his carcase in mud, is absurd. Give him in

his pen daily a handful of weeds or vegetables with their roots, or when these cannot be had, a supply of fine charcoal with a little flour of sulphur once a week, and you need not fear keeping his exterior too clean and sleek.

Never feed a hog on unground or uncooked food. Farmers diminish their profits more perhaps by a neglect of this rule, than any other. Grain fed to animals whole, is much of it lost to the purpose of nutrition, as the process of mastication renders but a small part of it sufficiently fine for the juice of the stomach to act upon advantageously. The more effectually hard grain can be pulverized, the better, and when divided in this way as much as possible, cooking or boiling should be added to render the process as perfect as possible. Allow me to ask the farmer, who sneers at the idea of making his corn into pudding for his hogs, what his family would say were he to order a quart of meal and a little water to be dealt out to them, instead of allowing its conversion into suitable and nutritious food by boiling. Our effort in fattening animals should be, to relieve nature from all unnecessary labor, and this is most effectually done by grinding or cooking.

Feed hogs at a time no more than they will eat. We are apt to consider swine as not very particular in matters of taste; but a well fed porker is occasionally very fastidious in his food, and nothing at such times disgusts a swine sooner than to have his trough too deeply replenished. They should have enough at all times, however, and *enough* in fattening pork, means just as much as the hogs will eat.

Reserve your best and sweetest food for the last. If you use, as most farmers do—and without it, making pork would be a dead loss to the farmer, at the prices corn and other grain has borne for some years past—apples or potatoes for feeding hogs, let them be given for the purpose of bringing them forward, and the filling up and finishing of the process be done with the corn or peas they are to receive. Apples will make as sweet pork as any feed in the world; but neither these, or potatoes, will give pork of the hardness and consistency of that made from sound corn, and of course where any of this is to be fed, it should be reserved to the time when its good effects will be most sensibly felt.

Experience has convinced me, that by following these few and simple directions, more pork, and of a much better quality, can be made from a given amount of food, than is now usually done; and when it is recollected that at the rate of only 50 lbs. to an individual—a small allowance—one hundred millions of pounds are required in this state, it will be seen that a saving of twenty per cent. in the feeding, or an increase of that amount in the product, amounts to a sum handsome in itself, and worthy of the notice of the producer as well as the consumer.

AN OLD FARMER.

BOOK-FARMIMG.

Extract from Judge Buel's Address to the Berkshire Agricultural Society.

Allow me to take a farther disgression, to speak of a means of improving our husbandry, which is too much neglected, and too often contemned and ridiculed. I allude to what is sometimes, in derision, termed *book farming*, but which in reality offers the most substantial facilities to improvement, and the acquisition of wealth. Let us inquire what this book farming is.

A German, by means of study and observation, aided by a long course of practical experience in husbandry, has been able to ascertain the degree of exhaustion in fertility, which soils ordinarily undergo, from the growth of common grain crops—and how much their fertility is increased by given quantities of manure, and by pasture—thus teaching how to maintain, or to increase, the fertility of the soil, and consequently its products and its profits, from the resources of the farm.

Other men have been assiduously engaged, for years, in studying, and have satisfactorily ascertained, the laws by which heat, air and water, are made to exert their best agency in preparing the food, and accelerating the growth and maturity of plants—and have published directions how to derive the highest advantage from these primary agents of nutrition.

And others have invented new and improved implements and machinery, calculated to relieve agricultural labor of half its toils.

A farmer in Ohio, raises fifteen hundred bushels of Swedish turnips on an acre of ground, enough to feed and fatten ten bullocks seventy-five days. A farmer in Massachusetts, by a new mode of managing his corn crop, has realized a nett profit of $150, on little more than an acre of land, while his neighbors, in the same season, and in adjoining fields, have not been remunerated, in their crop, for the expense of culture. A farmer in New-York, has proved by experiment, that by a new process of making hay, he can save ten per cent in weight, something in labor, and other ten per cent in the quality of his forage. Another farmer of my acquaintance, has cultivated twenty acres of Indian corn, and eight acres of beans the present season;—the former, estimated to average forty bushels the acre, and the latter giving more than an ordinary yield—without employing a plough, or a hand hoe, in the planting or culture—the whole work having been performed with the drill barrow and cultivator, implements of modern introduction, thus economizing from one-half to two-thirds of the labor ordinarily bestowed.

These are all matters of recent record, but as they happen to be *printed*, they very properly fall under the denomination of *book farming*. But are they, on this account, less true, or is the information they contain less useful in your practice? If a neighbor makes a palpable improvement, by which he doubles the value of his labor, you readily avail yourselves of his discovery, though you do it by stealth. Through the means of agricultural publications, the entire farming community stand in the relation to you of neighbors—you become acquainted with all their improvements, and are enabled to profit by their skill and science. I might detain you for hours with details of improvements in husbandry, which are essential and accessible to the farmer. Hundreds of men of profound science, and thousands of the best practical farmers, in this and other countries, are engaged in improving agriculture—in making two, three and four blades of grass, and two, three and four bushels of grain grow, where but one blade, or one bushel, grew before; and they are tendering you

the benefits of their labors, in the agricultural works of the day. The accumulated experience, and the improvements of centuries, have been registered by the press, and their benefits are tendered to all who will read and profit by them, almost without money and without price. He that will read, may learn.

From the Ohio Farmer.

PLUMS.

The common wild plum, furnishes the best of stocks, for the propagation of the choice varieties. It is hardy and free from most diseases. As its growth is slow, it somewhat dwarfs the grafts of the finer kinds, that are naturally more luxuriant. This tends not only to render them more fruitful, but to prevent the fruit from rotting before it comes to full maturity.

The grafts will, in a few years, out-grow the stocks, but the wood of the latter is so tough, that I have never known them to break off, after the wound, from the operation of engrafting, was entirely healed. Every neighborhood at the west, abounds with the wild plum. The thriftiest trees, from an inch to an inch and a half in diameter, should be selected and transplanted in autumn to the places where it is intended they shall remain. Care should be taken to preserve every root if possible; the tops should be thinned out, but no large limbs should be amputated. The hole to receive the roots should be at least three feet in diameter, and eighteen inches deep; this should be filled with the richest earth, but *not with manure*. They require a rich soil, and it is best to cover the surface, for a few feet around the tree, with compost, tanners' pates, lime and bark, horn-tips, bones, coal-ashes, or any other articles that will keep the ground loose, moist and rich.

When the trees have entirely recovered from the shock of transplanting, engraft them, and not before. It will require at least two years for them to get over it.

In performing the operation of engrafting, saw off the main stock or the leading branches, as the size of the tree may require; where they are not over an inch or an inch and a half in diameter, pare off the surface of the stock with a sharp knife, split it down two inches through the centre with a thin butcher knife or other convenient instrument, and then keep open the split by driving in a polished iron wedge, which every farmer should keep for the purpose. A shoulder should then be cut on each side of the graft, two inches from the lower end; and from these shoulders, it should be gradually sloped off, by a clean cut, so as to form a wedge that will exactly fit the cleft, in the stock. Next insert the graft into the stock so that the inner barks of the two will be parallel to each other. In this manner, a great extent of surface comes in contact between them, not only on the whole length of the wedge, but between the shoulders of the graft and the top of the stock; and the graft is at once supplied with a full flow of sap. This is not the case with those set by the transient engrafters that infest our country every spring, who insert their grafts obliquely to the stocks, and leave them to half starve, if we may use the expression, for the want of support. In one instance, the grafts will grow from three to six feet; in the other, not as many inches.

The next process is to protect them from the air and weather. This is best done by carefully surrounding the top of the stocks with grafting cement (resin 73 parts, beeswax 17, and tallow 10,) warmed to the right consistency. Over this, place a thick coat of well worked clay, and confine the whole by surrounding it with some pliable cloth and tying it on with pack-thread; the cloth should be about eight inches square, and should be perforated with two small holes near its centre, at a suitable distance apart, for the grafts to pass through, when it is placed over the top of the stock. Two grafts should always be inserted—if both live, one can be shortened from time to time, so as to finally give the nourishment to one. In this method the wound heals better than if only one is inserted.

If cement alone be used, it will often destroy the grafts in our hot summers at the west. Clay without cement does not sufficiently exclude the air and wet; combined they act to the best advantage. When tow is employed in place of cloth, birds are apt to strip it off, for furnishing their nests. This, however, can be remedied by coating it over with thin mud.

Plum trees should, if possible, be set where swine can have free access to them. The curculio insect that stings the fruit will be in a great measure exterminated on a country farm, if swine can have an opportunity to eat up the premature droppings. When this cannnot be done, the method of shaking the tree, with sheets placed under it at the time the insects are performing the operation, will succeed, as I have tested fully for a number of years.

Old and exhausted varieties are not worth cultivating. Much care should be used to select those that are young, healthy and fruitful.

From the Horticultural Register.

ON TRANSPLANTING ORNAMENTAL TREES, IN TOWNS AND CITIES.

There are but few subjects of a more engaging and useful nature in the environs, and indeed in the interiors of towns and cities, (where a proper space can be admitted,) than the presence of ornamental trees that at once give a pleasing variety to the scene, and add to the comforts of the citizen by their cooling shade in the summer season. But, although this branch of arboriculture is so much cherished, in almost every part of the union; by general observation it will be seen, that, many failures happen in planting; and that, many trees are altogether misplaced, owing *to a mere want of consideration*, at the time of planting and a trifling additional expense.

The first consideration in this, and indeed in all other descriptions of ornamental planting, is, in the selecting of the proper kinds of trees adapted to the purpose, that will thrive and have a healthy appearance in the situation they are planted in. The best and surest method to this method of planting, is, to select such trees as are of an ornamental character, and thrive well in the neighborhood of the town or city they are to be planted in: the choice of the kinds should be made from trees fully grown, from which the true *characteristic* and *habit* can be seen. There are many kinds of trees well adapted for this purpose in the different

sections of this country and although, perhaps the very kinds that are the most adapted and ornamental in one town are not so in another. This depends on climate and location. The *Alianthus glandulosa* or Tree of Heaven and the *catalpha syringifolia* answer admirably well as ornamental trees in New York city; their habit being well adapted and hardy enough to withstand the climate; but in Boston, Albany and the colder places, the winter's severity acts on their system and injures them materially; on the other hand, the maple, the lime, the horse-chestnut and elm thrive well in New York and almost every city they are planted in.

The kinds of trees being decided upon, the next thing is the selecting them for planting, which in all cases I should recommend to be taken from nurseries: although in many cases, trees do well taken from woods, it cannot be recommended as a general mode to be followed in planting. Trees taken from woods rarely possess the proper qualities for this kind of planting; in woods, trees generally grow thickly together, consequently their bark is thin, the roots large, with few fibres, and their tops slim and weakly; these consequences arise from their being excluded from a free access to the sun and air; which so much improve the habit and constitution of trees for transplanting purposes. In the act of planting trees of this kind they are generally divested of their roots and tops, *the very organs that draw food and nourishment to the tree*, therefore, without very favorable circumstances it must eventually die; on the other hand, trees grown in a nursery are mostly well rooted and have fine, healthy, well formed tops, and other requisite properties for removal.

Having selected and procured the trees, the next thing is the planting, which is often done by digging out a few shovels full of gravel and placing a tree in a hole not sufficient to receive the roots of it. In this situation a tree being deprived of most of its roots and branches, makes a feeble effort of growth in the spring; but, so soon as the dry season commences, it presents to the planter dead leaves and a lifeless *pole*. The proper manner to plant a tree in such places is, to take out a large hole say two cartloads of gravel and like, which is to be filled in with the same quantity of good loam with a portion of well rotted manure incorporated therewith. The tree is then to be carefully planted therein, observing well, to spread the roots in their natural position and tread the earth carefully about them, which, if very dry, pour into it a pail or two of water, to make it adhere more closely to them.

The trees being planted they should immediately be protected by boxes, stakes or otherwise, in order to guard off cattle or other things that are liable to come into contact and move them from their position, which will deter them from taking root and growing freely in the spring.

When the trees begin to grow in the spring, apply a pail or two of water to each, every two or three days through the months of May and June, when they will be well established and need no other care than being well protected and occasionally pruned.

The best time for planting trees on dry bottoms is at the fall of the leaf; in most low situations early in the spring.

PROCEEDINGS OF THE FREDERICKSBURG AGRICULTURAL SOCIETY.

Friday, November 10.

The society was called to order at 12 M, when, on motion, the late officers were unanimously re-elected.

Many persons proposing, were severally admitted members of this society. After some arrangements preparatory to the *show*, the society adjourned to the field to witness the exhibition, and met again at 4 P. M.

The reports from the several committees were read and adopted.

The committee on riding horses, brood mares and colts, report, that Col. Robert Crutchfield is entitled to the premium for the best riding horse—that Mr. Wm. H. Tayloe is entitled to the premium for the best blooded brood mare—and also, that Mr. Tayloe is entitled to the premium for the best blooded colt, not exceeding 3 years old—that Mr. Charles Tayloe is entitled to the premium for the best 3 years old colt, without regard to blood—that Dr. E. P. White is entitled to a premium for the best mule colt.

The committee on stallions and jacks, report—that Robert Stanard's horse, Accident, is entitled to the premium for the best thorough-bred stallion—that Richard H. Pulliam is entitled to a premium for his horse Sir Bolingbroke, as the best common stock horse—also, the premium to Spencer Coleman, for his very superior jack.

The committee on bulls and milch cows, award the premium to Col. Payne Todd's North Devon bull, and a milch cow of the same stock. There were many fine milch cows shown, and by the rules, (there being no certificate of blood,) they were excluded from competition for a premium.

The committee on beef, mutton and sheep, award their premiums to Francis W. Taliaferro, for the best fatted work-ox—to William Jackson, for the best ram and ewe—to Wm. Jackson, for his imported Lincolnshire ram and ewe—to John Gray, for his grass-fatted mutton.

The committee on flour, award the premium to John A. Porter, of Orange.

The committee on agricultural implements, award a premium to George Washington Bassett, for his newly invented and highly valuable axle, for carts and wagons.

The society awarded the premium to Geo. Morton, of Orange, for the best 10 contiguous acres of Indian corn, the same yielding 101 barrels, 3 bushels, 1 gallon, and 2 quarts.

A very interesting communication was read by the first Vice-President.

The society then adjourned till to-morrow, 9 o'clock, A. M.

Saturday, November 11.

Pursuant to appointment the society met. On motion, twenty persons were admitted members of this society. The society then adjourned to the Town-Hall to witness the exhibition of domestic manufactures, and to hear the President's annual address.

At 1 P. M. the society convened—the President in the chair. Reports from committees were received and adopted.

The premium for butter was awarded to Mrs. Agnes Sanford.

The premiums for domestic manufactures were awarded: For the best carpet, to Mrs. Virginia Scott—for the best counterpane of wool and cotton, to Miss Mary Hooe; the best of cotton, to Mrs. Rebecca Wharton—the best stockings, to Miss S. C. Hill—the best piece of flannel, to Mrs. M. Rothrock—the best piece of negro clothing, to Mrs. Hamilton—for the best 4 ounces of sewing silk, to Mrs. Shackelford—for hearth rug, a discretionary premium to Miss E. Catlett; also one to Mrs. Mary Dickinson, for a piece of jeans.

After much discussion, the following resolutions were severally adopted:

Resolved, That a premium of $10 be awarded to the best acre of corn, to measure not less than 15 barrels.

Resolved, That a committee of three be appointed to examine the outstanding debts due this society, and place the same in the hands of some attorney with directions to sue if necessary. As the accounts are small, the committee are directed to contract for their collection upon the best terms.

Resolved, That the members of this society be earnestly requested to make written communications on agricultural subjects at each annual fall meeting.

Resolved,—That the report of the committee to whom was referred the old constitution and by-laws, be committed to a select committee of five, (any three of whom to act) with instructions to revise the same, and report at the next fall meeting. The chair appointed Wm. P. Taylor, George W. Bassett, George Hamilton, Dr. Wm. Browne and Francis W. Taliaferro.

Resolved, That the next annual meeting of this society be on the 2nd Thursday of November next, which day is to be devoted to the consideration of the report ordered to be made by the revising committee. The members of the society, now present, are considered as pledged to attend on that day.

Resolved, That a premium of $10 be offered to the wife, mother, or sister of the member who shall wear the neatest suit of domestic clothes at our next meeting—the same to be manufactured at home.

Resolved, That the thanks of this society be presented to the President for his able, interesting and appropriate address, and that he be requested to furnish a copy for publication.

Resolved, That the proceedings of this meeting, with the President's address, be published in the Herald and Arena, and Farmers' Register.

The society then resolved itself into a committee of the whole, "upon agricultural subjects, generally," when a most highly interesting and instructive "talk" ensued, which lasted till 9, P. M.: whereupon, the society adjourned.

JAMES M. GARNETT,
President.

ROB'T B. SEMPLE, *Sec'ry & Treas'r.*

EXCEPTIONS TO SOME POSITIONS IN DR. MUSE'S ADDRESS.

It is seldom that we express our dissent to the opinions of correspondents, as, in general, it is deemed more respectful, both to the writers and their readers, to leave such opinions to the judgment of the latter, without any bias produced, or attempted to be produced, by accompanying editorial objections. Still less would we be willing to avail ourselves of the customary editorial privilege of answering a piece in advance of the piece itself; and sometimes without giving it a place at all. Several considerations induce us, in this case, not to remain silent; though our dissent from some of the opinions of Dr. Muse, as presented in his 'Address,' published in No 9, will be concisely stated, and not argued at length.

First—as to Dr. Muse's belief in the transmutation of wheat to cheat, and the supposed fact adduced for its proof—(and which, *if not mistaken*, would, indeed, be most abundant proof)—we shall not renew a controversy, in which far too many mere words have already been published. *Facts* are wanted; such facts as no scientific investigator could question, or refuse to admit—and such as, if true, can be certainly produced, and offered to the observation of men of science, in such manner as to fix the truth beyond the possibility of future question. We offered, in this journal, several years ago, an honorary reward to any person who would clearly trace the product of heads of cheat from a grain of wheat. We now repeat that offer, and if the effect is so easily produced, as is generally supposed, and by so many different causes, surely, by employing any one, or all of these causes, such scientific intestigators and believers in the transmutation doctrine as Dr. Muse, Mr. Featherstonhaugh, or Judge Buel, might both produce and prove the effect.

We believe, with Dr. Muse, that the earth is gradually becoming lower in temperature; that the now frigid zones once bore the animals and vegetables which live now only in the torrid, or temperate; and that when the now still burning and melted interior of the globe shall have cooled, our present temperate station will be covered with eternal snow. But we differ greatly as to the rate of the progress of this change. The lapse of the last 2,000 years has shown (in historical records,) so slightly the effects of the change, that most investigators have assumed the reverse result to be the true one—that is to say, that the world (at least the part improved by agriculture,) has been gradually becoming warmer, instead of colder. We, therefore, infer that the cooling process is at all events so slow, that no perceptible effects on our crops would be expected in "half a century"—and scarcely in two or three centuries. If this was the cause of the frequent failures of our wheat crops, the effect would be the more striking as we advanced to colder stations---which is not the case, as we believe---and if Dorchester, in Maryland, was already becoming too cold, we might suppose that some where in the Carolinas there would even now be the best climate for, and the best products of wheat.

The fact stated by Dr. Muse of the very slow progress of disintegration in the old and "half decomposed" oyster shells, which he used for manure, from old Indian banks, though undoubted in his particular application, ought not to be deemed likely to be general. We will hazard the guess that the soil to which he applied these shells was not such as we have termed "acid;" or, if the soil was, indeed, acid, that the manure was more in quantity than was wanting to

neutralize that quality. The progress of disintegration, by the mere mechanical action of the elements, and of tillage, is, indeed, very slow; but when the chemical decomposing action of the soil, (or of putrescent manures, in compost,) is added, the reduction of all "half decomposed shells" is so rapid, that no objection to their use will be found on that score. Such is our experience of fossil sea shells, such as the marl beds usually present; and they are fully as firm as the old oyster shells of the Indian banks have appeared to our view, and as they are described to be by Dr. Muse.

In regard to the remarks of the author of the 'Address' on the importance and need of legislative aid to agricultural improvement, we have only to join our ardent wishes that his success in stimulating such action may be equal to his zeal in urging the great end of the support of agricultural interests. But our wish can scarcely be termed a *hope*—unless the legislature of Maryland is composed of very different materials from that of Virginia. But we shall not cease to raise our voice, and exert our efforts, for this object, whether with or without hope.

From the Genesee Farmer.

FOOD.

It appears to be a wise dispensation of Providence, that has provided that each step in the advance and developement of matter, shall furnish the means of a higher and more complicated material existence. This truth can be distinctly traced in every species of organization, but in none more conclusively than in those which are intended for food, or a supply of nutrition to animals and man. The ox could not appropriate the simple elements that constitute flesh and bones directly from the soil; it was necessary that the vegetable organization should intervene, to take up and prepare these elements for his use; and man, omnivorous as he is, shows little inclination to resort to herbage when he can get roast beef, and the example of Nebuchadnezzar in going to grass, has as yet, obtained but few followers.

That man was destined to eat meat, is demonstrated from his anatomical conformation; and such destination agreeing with his inclination, it is probable, in spite of fashionable lectures on vegetable diet, that he will eat meat whenever it can be procured, which, fortunately for the laboring man of this country, is very easily done. Such being the case, it becomes an important question in domestic economy, so to cook or prepare this essential part of sustenance so as to have it the most nutritious, and at the same time waste the least in cooking.

Flesh, in all its varieties of muscle, membrane, and tissues, is composed of *gelatine*, *fibrine*, *albumine*, and *ozmazome*; but these principles do not exist in all flesh in the same proportions, and they vary according to the age and species of the animal. Gelatine abounds in young animals—in older ones fibrine prevails. Albumine is found more or less in all. Ozmazome is scarcely present in the flesh that is white, as veal and pullets; but in beef or full grown animals, is abundant. To this last substance both owe its color, its aromatic odor, and agreeable flavor. To the proper proportion and combination of these substances the nutritive properties of flesh are owing, and when these are destroyed or dissipated in cooking, the value of meat for food is in the same proportion lessened.

Meat is usually prepared for food by boiling or roasting, yet whatever the mode may be, there must be some loss, consisting chiefly of juices, soluble matter, and fat. Professor Wallace of Edinburgh, instituted a series of experiments to ascertain the relative amount of loss by the processes of boiling or roasting, and admitting the quantity of bone in each case to be the same, which was near the fact, the result was as follows:

100 lbs. of beef lost in boiling,	26½	lbs.
100 do. do. in roasting,	32	"
100 do. do. in baking,	30	"
100 do. of legs of mutton, averaging about nine and a half lbs. each, lost in boiling, - - -	21½	"
100 do. shoulders of mutton, averaging ten lbs. each, lost in roasting, - - - -	31½	"
100 do. of loins of mutton, averaging eight and three-fourth lbs. each, lost in roasting, - - -	35½	"
100 do. necks of mutton, averaging ten pounds each, lost in roasting,	32½	"

By these experiments it appears that in boiling beef or mutton, the loss is less than in roasting; and that meat loses in the cooking from one-fifth to one-third its weight. The average loss in boiling and roasting, according to Professor Wallace, was 28 per cent., but while legs of mutton only lost 21 pounds in boiling per hundred, loins of mutton in roasting lost per hundred 25 lbs.

In preparing his volume on domestic economy for 'Lardner's Cyclopædia,' Professor Donovan insituted a more extensive and rigorous set of experiments, in order to ascertain the actual loss in cooking by different methods, and the cost to the consumer of each pound of meat of the various kinds, divested of bone, and purchased for cooking at the usual market price. This examination gave rise to some curious results, embodied in a table, a few items of which we have selected as showing the difference in price between raw and cooked food, and the average loss in cooking.

Kinds of food	Cost p. lb. raw.	Cost p. lb. cooked.	Loss p. ct. in cooking
Salted beef boiled,	6*d.*	7¾*d*	13
Salted brisket of beef boiled,	6	8½	18
Legs of mutton do	8	10	10
Salt pork, do.	8	10½	13
Shoulders of mutton roasted	7	11	28
Ribs of beef, do.	8	11	18
Legs of mutton do.	8	12	21
Sirloin of beef do.	8	13	20
Haunch of venson do.	–	46	—
Woodcocks do.	–	192	—
Quails do.	–	288	—

In the experiments the meat was carefully dissected from the bones, so as to ascertain the exact

amount of flesh, and the loss in cooking, and consequently the difference in price before and after. In summing up his results, Mr. Donovan says: "It appears that the flesh of a woodcock sometimes costs 16s. per pound. But the flesh of the quail is still more expensive. This bird fattened is frequently sold at 3s., and when allowance is made for the loss in cooking and the bones, the meat may be estimated at two ounces, which brings the cost of the cooked flesh to £1 4s. per pound, (or about six dollars.) Those to whom such morsels are necessary, are not to be envied." The price of venison cooked does not vary much from one dollar a pound; dear buying surfeits we should think.

From these experiments of Messrs. Wallace and Donovan, it is clear that where economy is consulted the greater part of the meat cooked will be boiled; as the loss is decidedly less than by roasting, and experience has shown it to be nearly or quite as digestible and nutritious when cooked in this way as in any other. In whatever way flesh is cooked, it should be *done;* but this does not mean that it should be roasted, or fried, or baked, to scraps. Cooked properly, it is more easily digested, and far more nutritious, and the loss is generally less, than when devoured raw as with the Abyssinian, or roasted to a crisp as is the custom in Turkey. Every thing that relates to domestic economy should attract the notice of the farmer; and where flesh is as much an article of food and of comfort as with us, the daily saving that may be effected by boiling in preference to roasting should not be overlooked. The rich may be allowed to consult their appetite at the expense of their health if they choose; that man is fortunate who is able to gratify the first without endangering the last.

From the Genesee Farmer.

CONTAGIOUS TYPHUS AMONG CATTLE.

Such is the name given by Professor Delafond, of the veterinary school at Alfort, to a disease among cattle, the history of which, from its first well authenticated appearance about a hundred years since, he has been engaged in investigating, and which at each periodic return appears to have been as fatal to cattle as the black death, small pox, plague, and cholera, have proved to the human race.

The best accounts of the epizootic typhus, makes it originate in Hungary, in 1711, whence it spread into Italy, Germany, Switzerland, Piedmont, Holland, France, and England; taking about seven years in its circuit, and setting at defiance every effort made to check its advance. In Piedmont 80,000 cattle died in a few months; in Holland more than 200,000 beasts perished; and in other countries it visited, it was equally fatal, the total number destroyed during the seven years being estimated at more than 600,000.

Twenty years afterwards the same disease appeared in Bohemia, among the cattle collected for the use of the French army occupied in the siege of Prague. It again overran Europe, taking nearly the same course as before, and was conveyed from Holland to England. All the skill of the most cebrated physicians of Europe was put in requisition to arrest its ravages, but without the least effect; and when after ten years it ceased of itself, it was estimated that not less than three millions had been swept away.

During the next twenty years Europe was free from this epidemic, but in 1771 it reappeared in Holland and committed the most dreadful ravages. In one year in the Province of Friedland, 96,000 cattle died; in South Holland, 115,665; in North Holland, 225,831; and it spread into Flanders and France, but the whole number of cattle that died in these countries was never correctly estimated. Scarcely cattle enough, however, were left to till the soil, and on the borders of the Mediterranean, which had escaped the last visitation, more than 150,000 cattle died.

During the wars of the French Republic, in 1793, 4 and 5, and of which Italy was the principal theatre, the typhus again broke out, and following the course of the armies, destroyed in a few years 3,500,000 cattle. In 1790 it appeared among the cattle collected for the French army of the Rhine, and spread with frightful rapidity over the departments of that part of France and part of Holland destroying not less than 200,000 cattle. At this time a detailed calculation, made from authenticated statements, was made by Dr. Faust, and it appeared by these returns, that the number that had perished in Belgium and France alone, since its appearance in 1711, was not less than ten millions.

In 1814–15 the combined armies arrived in France, with these hordes of Hungarian bullocks, and contagious typhus soon broke out and spread with fatal rapidity. The return of peace, however, checked its progress, and it soon disappeared; since which time it has scarcely been heard of as an epidemic, in any country.

The researches of the professor have established the following facts: 1st. That from 1711 to 1814 contagious typhus has appeared about once in twenty-three years. 2d. That on each appearance it seems to have arrived in the train of Hungarian cattle. 3d. That it is strictly contagious, and spreads in this way alone.

Wherever war long continues to rage, typhus fever breaks out among cattle. These two destroyers of men and cattle appear in some manner inseparable. A comparison of the times specified above as the period of its ravages, with the history of the same time, will fully establish these facts. The causes of this connexion between the march of armies, and the propagation of the typhus have been detailed with great force in a report by M. Rodet. Crowded together in large masses—breathing an impure and vitiated air—forced to make long and fatiguing marches—at one time sleeping in the cold open air, and then crammed into stables or enclosures—forced by thirst, to drink at times of the most impure and stagnant water—their food scarce, or of bad quality, it is scarcely possible they should escape typhus; or that when once the disease has originated, it should become fatally contagious.

In the origin and spread of this disease, the farmer will find a strong argument for the necessity of regular feeding, pure water, free ventilation, and plenty of room for his flocks, and herds, if he would avoid the origin or spread of disease among them. American farmers are unacquainted with many of the diseases that exist in the older countries of Europe; but there can be no doubt that fatal diseases among sheep and swine in this

country may be sometimes traced to the same causes designated above, viz: crowded enclosures and impure air; errors, which, wherever they exist, should be carefully corrected

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ADVANTAGES OF LIME.

To the Editor of the Farmer and Gardener.

Dear Sir,—Although unaccustomed to writing for the public, it gives me pleasure to comply with your request, in my plain way, in giving you my views, in relation to the value of lime, and the result of my experience and observations in the use of it. Few have been more benefited by the experience of others, and none more willing to profit by the good example of a neighbor; I cannot, of course, object to offering my mite to the common stock, trusting that, like the widow's mite, it will be received with the same liberal feelings with which it is offered. At the age of eighteen I took possession of a large farm, within six miles of Baltimore, which had been tenanted out for upwards of forty years, without any restrictions. To you who have a personal acquaintance with it, it would be unnecessary to say, that it was completely worn out; but a stranger may form some idea of its miserable condition, when I assure you that for several years before I took charge of it, the income from 600 acres did not amount to $150 per year. I soon discovered that it was perfect folly to farm poor land, and directed my energies to improving. My attention was soon directed to lime, by an old English gentleman who had lately bought in my neighborhood; but so strong were the prejudices of the farmers generally to trying "visionary notions," that it was thought only those who had money to throw away could afford to use it; and, as I had none to spare, I concluded to follow the example of my "old experienced and most thrifty neighbors," by sending a load of wood to the city, and bringing back a load of ashes. This I continued for several years, by which time I was fully convinced it was too slow a business, for I discovered that by the time I would reach the third or fourth field, I should have to go the rounds again; besides, with all my industry through the winter, we could not get up more ashes than would manure nineteen or twenty acres, consequently requiring twelve years to improve 200 or 240 acres. This, I thought, would never do; to look forward to growing gray at so slavish a business, was rather a dull prospect for a man of my sanguine temperament. In the meantime I had been watching closely the effect of lime on my old English neighbor's farm; and was by this time convinced that there was something more than "visionary notions" in the use of lime, and at once looked to lime as the only way for me to get along; but how to manage it was the difficulty—I had not the ready cash to buy with, and was afraid to go in debt. I saw an abundance of limestone about three miles above me, which seemed to be little valued, and knowing I had plenty of wood, soon went to calculating what it would cost me to haul the stone and burn the lime, and at once satisfied myself that by doing the work "within myself" the cash expenses would not exceed eight or ten cents a bushel, whilst I should have to pay the lime burners twenty-four cents. I at once went to work to build a kiln that would burn 1,500 bushels, and never shall I forget the concern it occasioned among my friends. Those who lived in the midst of limestone, thought it impossible my experiment would succeed, having such a distance to haul the stone, whilst "my old experienced neighbors" still thought it money thrown away to put lime on the land; and, never shall forget the earnestness with which an old and valued friend, Mr. T ———, admonished me of the hazard I was running, and the seriousness with which he attempted to dissuade me from my "wild notion:" the boy, he was sure, would ruin himself—for the old gentleman knew that my cash means were very slender. "The boy," however, persisted; and, I am sure, I would not exchange the profits of my lime kiln for that of some of the gold mines. Every day convinces me more strongly, that but for my lime kiln, I should have been a broken farmer. My kiln was scarcely under way before the example was followed by another; and now, after a lapse of eight or ten years, they are as thickly dotted over the neighborhood as you will find in any part of the country where they have limestone on the spot: and it has become a proverbial saying, that wherever you see a lime kiln, "That man is well to do." As to the mode of applying it, I have ever pursued the same system; viz., spreading it on the surface, the quantity depending on the condition of the land; on very steril soil, the quantity should not exceed fifty bushels per acre, and I doubt very much whether the product of any land will be increased for the first few years by a larger quantity; but where (as is the case with myself) it is important to save manual labor, you may safely put on land that has a sod on it from 120 to 150 bushels per acre; and, no doubt, the effect will continue many years longer than if a smaller quantity was applied. On my farm, I have two kinds of soil, the gray rock and a gravelly soil; lime acts powerfully on either, but most so on the gray rock: and, I find, will admit of a much larger quantity being used at a time. On land that would not bring more than three barrels of corn to the acre, I am confident has often, by one dressing of lime, been made to produce the first year from five to seven barrels; and land that a few years since was covered with poverty, grass, and briar bushes, now produces me fine crops of timothy, corn, and wheat. It is highly gratifying to see the eagerness with which the *young farmers* of my neighborhood are improving with lime, and the white heaps in the spring afford a delightful variety to the appearance of the neighborhood. As long communications are never read, I will cut this short, with the promise to write to you again. Yours, &c.

W. G.

Baltimore county, Nov. 28, 1837.

From the Farmers' Cabinet.

LIME.

The discussion respecting the application of lime as a manure, reminds me of the anecdote of the old man giving advice to his son. "Put your lime," he said, "if possible, on your sod before it is ploughed. If you can't put it on before it is ploughed, put it on as soon as possible afterwards. And if you can't put it on after it is ploughed, then put it on the best way you can."

My design, at present, is to communicate a few facts, which have come under my immediate ob-

servation, and the result of the experience of others, in the application of lime as a manure.

In this vicinity it is becoming almost universally the practice, to apply the lime to the sod, the year previous to its being planted with corn. With this method several advantages are connected. *First*, The lime may be hauled and spread, at any convenient time during the season—say, in May and June, between corn planting and hay harvest. *Second*, The crops will derive much more benefit from its being put on the land some length of time before it is ploughed, than to put it on just at the time of putting in the crop. It has been duly ascertained, that one of the principal effects of lime is, the decomposition and bringing into action, the inert vegetable matter in soil. When lime is spread on the sod, it comes into immediate contact with the grass, and grass roots, than when the ground is first ploughed; in fields which have been partly limed on the sod, then ploughed, and the remainder limed at the time of planting with corn. I have observed in ploughing up corn stubble, that the part limed on the sod, ploughed up much mellower, than that limed *after* the sod was ploughed; presenting a rich vegetable mould not observable in the other part of the field.

There are no kinds of crops which have come under my observation; namely, corn, oats, barley, wheat, rye, potatoes, clover, and timothy, but what are benefited by lime, with the exception of flax. Where flax was formerly raised to great perfection, a very inferior article is now produced, since the application of lime. This has almost led to the abandonment of its cultivation in many sections of the country.

Oats, however, if the lime is applied fresh the season it is sown, will rather be injured than benefited by it, in preventing it from ripening. I have seen oats, in fields which had been recently limed, send up an indefinite number of suckers or young stalks from the roots; which, together with the parent stalk, would scarcely ripen if allowed to remain the whole season in the field; and the stubble would sprout up profusely after a crop was taken off. But when the lime has been applied a year or two previous, it is decidedly a benefit to the oats. Lime can be applied with advantage, whether put on fresh, or left exposed to the elements till it becomes cold. This has been exemplified in the application of mortar from old buildings, which has been known to produce lasting effects. I have been told by a person who has had much experience in liming, that he has had clover to succeed better, after putting it on fresh slacked and hot, than in any other way.

The Lancaster turnpike, in the vicinity of the Great Valley, is supplied with stone from the quarries of primitive limestone in the south side of the valley. I have observed a field adjoining the turnpike of a thin slaty soil—the subsoil of which is composed entirely of a slate gravel, (and, perhaps, there are many others of a similar nature and similarly situated;) which has had no burned lime applied to it for, perhaps, an age, and yet is remarkable for its productiveness—being far superior to many others in its vicinity, which are possessed of a much richer natural soil. Part of this field receives the flood of the turnpike, by which it becomes overspread with the pulverised limestone of the road; and the other part is visited, in dry weather, by clouds of dust—which, in my judgment, is the great stimulant to its vegetable productiveness.

If these facts amount to any thing, it appears that lime, applied in whatever form, is a stimulent to vegetation. But the form and manner in which it may be most advantageously applied, I leave for others yet to determine. A.

Chester county, November 2d, 1837.

REPORT OF THE SECRETARY OF THE CENTRAL AGRICULTURAL SOCIETY AND MECHANIC INSTITUTE.

[Ordered to be published in the Farmers' Register.]

Thursday, October 26, 1837.

The society held its second anniversary in Lynchburg, according to the adjournment of last year. The day was ushered in by torrents of rain, which continued, with slight intermissions, from an early hour until evening; yet such was the interest felt on the occasion by the members, and by the public generally, that, at the usual hour, the avenues leading to the places of exhibition were thronged with persons moving to and fro, to witness the improved productions of the country, which had already been assembled in considerable numbers.

Preparatory to the show, the members of the society convened in the Methodist Episcopal Church; Odin G. Clay, of Campbell, President.

The meeting was called to order, and the various committees received their respective lists of articles on which they were to award premiums.

A communication was received, with feelings of regret to the society, from the rev. John Percival, stating his illness, which would prevent him from delivering the annual address.

The meeting then adjourned, for the exhibition, till to-morrow, 12 o'clock.

The remnant of the day was employed by the society, and by a numerous collection of citizens, from town and country, in examining the fine stock of various kinds, which were collected in generous emulation, at the places appointed for them. There were the Durham, Devon and Alderney cattle, wrought in the finest mould, and of the largest size—(we speak, of course, for our own country)—the Bedford, Barnitz, Chester, Berkshire, Mackey, and Surry breeds of hogs, greatly improved in appearance, and profit over our hitherto neglected Virginia stock; the Bakewell and Mead's improved sheep, which stand foremost, the one for the shambles, and the other for the amount and texture of the fleece; and lastly, (though without a rival exhibition of the kind, perhaps, in this section of the country,) there was a display of that noble animal—the horse, in every variety of age and degree of improvement, that might have claimed respectability in the best farming districts of the south. In a word, we will venture the assertion, that a better collection of domestic animals was never before viewed in Virginia, from beneath a greater host of umbrellas.

Faiday, October 27.

At an early hour, the members of the society and the citizens assembled in the long room of the Franklin hotel, for the examination of the ladies' manufactures. And here a scene presented itself,

of which the society may well be proud, as having been the organ through which it was given to the vast crowd of spectators assembled to witness it. The long line of tables, which had been erected for better display, and every corner, teemed with silk, cotton, and woollen fabrics, purposed for every form of utility, and for the gratification of every freak of fancy; all combining taste, beauty, and usefulness, in their appearance; and telling of industry, ingenuity, and improvement, in their makers. The display of counterpanes, blankets, woollen cloths, flannels, carpets, table linens, &c., &c., comprised a host of articles of various grades and texture: and many who examined them, were doubtless led to inquire, why should the farmers of Virginia give their money away for the foreign fabric, when the little household factories, by their own fire sides, impelled by the hands of their own fair wives and daughters, can thus yield all that comfort can require?

Various other articles of fine workmanship, as saddles, harness, cabinet furniture, chairs, &c., were likewise exhibited, which reflected great credit on their manufacturers.

Of implements of husbandry, only two ploughs were shown, and these by professed makers. Are there no new inventions or improvements in the thoughts of our farmers? Where are the rollers for meadows and for clover seed—the improved harrows and cultivators, and ploughs for the saving of labor, and for more successful tillage—the forage cutters for the economy of time and food—and the many other inventions which men have thought of, and yet from inertia, or the fear of the jeers of the ignorant, have been suffered to remain intangible and unknown? Cannot these be brought to the light and test of experiment another year?

Many beautiful and well-wrought articles of various kinds, were sold at auction, which the secretary intended to notice, but could not from the immobility of the crowd which surrounded the auctioneers. It is hoped they brought good prices; if they did not, the excuse must be found again in the density of the multitude, which prevented even the slightest examination; for we are sure the fault cannot be charged to the want of a proper regard for home industry.

After the citizens had dispersed, and the committees had completed their labors, the society met in the ball room of the Franklin, and was called to order by the president.

The secretary proceeded to read the awards of premiums by the committees, which, with some amendments and revisions, were adopted. These have already been published, and the secretary deems it unnecessary to repeat them here.

But before the completion of the business of the society, it adjourned till to-morrow, 10 o'clock.

Saturday, October 28.

The society was called to order at the hour adjourned to yesterday.

After some discussion on various points, on motion of the Rev. John Earley, the 11th article of the constitution, which provides for the election of speaker of the annual address by the society, was repealed, so as to make it the duty of the executive committee to select the orator, at least two months before the anniversary.

On motion, *Resolved*, That persons residing without the bounds of the society, who trade to Lynchburg, and who may desire to become members, with a view to the exhibition of their crops of tobacco or flour, for premium, be allowed the privilege of doing so, on or before the day of such exhibition.

Resolved, That all reports of the committees, recommending special premiums, be referred to the executive committee for future action.

The society then went into the election of officers for the ensuing year, which resulted as follows, by nomination, and unanimously; viz.,

Odin G. Clay, *President*; Elijah Fletcher, 1*st Vice President*; Benj. Wigginton, 2*d Vice President*; Thomas M. Bondurant, 3*d Vice President*; Henry S. Langhorne, 4*th Vice President*; Achilles D. Johnson, *Secretary*; George D. Davis, *Assistant, do.*; John H. Tyree, *Treasurer*; Dr. Wm. Owens, John M. Warwick, Rev. John Early, Nathaniel I. Manson, Dr. Robert Withers, Champe Carter, James A. Merriwether, John Thurman, Ammon Hancock, John G. Meem, Benjamin Wilkes, George Markham, Jehu Williams, Richard Perkins, Charles H. Lynch, Dr. Henry Latham, Dr. David Patteson, Charles H. Moorman, Maurice Langhorne, jr., Maurice H. Garland, Paschal Buford, James W. Morgan, *Executive Committee.*

Resolved, That the 6th article of the constitution be so amended, as to authorise five of the executive board to constitute a quorum, instead of a majority.

Resolved, That the secretary report the proceedings of the meeting for publication, under the superintendence of the officers.

Resolved, That the next anniversary be held on the last Tuesday in October, 1838.

And then the meeting adjourned *sine die.*

Remarks.

The arrangements by the executive committee for this, our second anniversary, though not so ample as experience might have taught, were yet the best that could be made on the occasion; and the thanks of the society are particularly due to Samuel Burch and Chesley Hardy, for their activity in making the mechanical preparations necessary. If, from the want of ample space, the density of the crowd of spectators, and the multitude of things exhibited to some of the committees, rendering the duties of these most arduous, some articles escaped attention, it is the misfortune of the society, rather than the effect of error, or want of proper attention to duty. We will only say to those, if any, who were overlooked, try again on another occasion, when the experience of our present defects will have taught us how to avoid them. Sagacity is the graduate of occasional misfortune. And the growing strength of the society, enables it to promise arrangements, space, and order, most adequate in future.

Shall this society continue to flourish? We ask those who have already enjoyed its amusements and felt its impulses. We ask those who witness, at its anniversaries, a development of home resources and industry, which before they had not thought of—those who have become feint with toiling on their ancestral heritages without profit, and who have already felt, under its influence, the generous impulses of improvement, and of consequent endearment to their native land.

These will doubtless answer in the affirmative, and will lend increasing energy to the enterprise. But what shall be said to the great public, who have not yet felt its influences, or who have as yet enjoyed only its amusements? We say, join the society—extend its operations—multiply its energies by producing honorable emulation, and by teaching a greater reliance on our own resources of industry and skill, than we have felt. It cannot be denied, that the society has already done something towards the improvement of our stock, our domestic fabrics, and even of our farms. It can, and will do much more, by a proper exercise of its functions. It promises to increase the value of lands, and to augment the supply of the necessaries of life; and its moral operation is to make the profession of farming so respectable by its products and profits, that men will be taught, by interest, not to forsake it. We appeal, then, to an enlightened community, not only to sustain it, but to extend its influence by becoming members.

ACHILLES D. JOHNSON, *Sec'y.*

DOMESTICATING BEAVERS.

The account given in a communication to the last number, of the returning of beavers to Nottoway river, is an interesting fact in natural history; and the suggestion of our correspondent of the plan of domesticating them, for profit, is well worth attention. If, instead of their being incessantly persecuted by trappers and hunters, some ten acres of hilly wood-land, on a stream, or pond, was given up to them for a secure place of refuge, it seems likely that their future increase would pay a good profit on the cost of the ground. It is probable, that if sufficiently protected, in such a situation, these animals would again use their wonderful instinct for the construction of dams, and houses for their dwellings; and if so, the colony would exhibit one of the most curious and remarkable cases of the habits and instinct of animals, in addition to the possible profit from the high priced furs of the surplus stock.

We beg that some land-holder on the waters of the Nottoway, will give the use of a few acres of his waste-land to the beavers, and by leaving them free from annoyance for several years, try to induce them to resume their social and building habits, which their dispersion, and continual alarm, have forced them to abandon. It is also worth the trial, on some of their young, as to their fitness for a state of complete domestication, in which they may yield their rich furs annually, without losing their lives, or without suffering more than sheep, when sheared. No domestic animal would be fed so cheaply, compared to its rich products, as the beaver: and none would be more harmless, and offer more amusement to curious observers.

For the Farmers' Register.

G. H. WALKER'S INSTRUCTIONS FOR GROWING TURNIP SEED.

I send you a copy, of the instructions of George H. Walker an English farmer, now residing near Holmesburgh in Pennsylvania, for growing turnip seed. I have found it of some value, as it has been the means, by which I have saved good seed for the last two years. He had the kindness to send me a small parcel of seed three years ago, and at the same time instructions for saving seed. I have grown the hybrid, and another sort of turnip procured from Baltimore, but have found Mr. Walker's so superior, that in future I shall grow none other; it is not so large, but its superiority consists in its soundness and richness. Perhaps this would have been better done, two months ago; but it did not occur to me till last week, when I was pulling my turnips.

WM. CARMICHAEL.

Wye, Queen Ann's county Md. 10th Dec. 1837.

"When pulling your turnips, in the fall, select the best formed turnips, not very large, with the strongest tops, and leaves, and without necks; the crown red, or purple, and the skin below the ground yellow; cut off the leaves, one and a half inches above the crown; leave all the roots; place them carefully, in a shallow hole, in a pile, cover them with straw, and then with earth well beaten down, to preserve them from the wet. As soon as the weather will permit, plant them out in the spring in good ground, close to each other, in rows thirty inches apart, as deep as the crown. When planted, cover them with short litter, to protect them from the frost; no other seed turnips, or cabbages, to be near them; they ought to be handled carefully: the breaking or bruising the crown, skin or roots, is a serious injury. When the seed is sufficiently matured, the tops to be cut and hung up to dry."

PRESERVING PUMPKINS.

A correspondent at Union Bridge, Maryland, under date of May 9th, says—"In looking over the Farmers' Cabinet to-day, I find a request from one of your subscribers, for information as to the best method of preserving pumpkins through the winter. I answer, that the way to preserve them one or more years, is, to pull them before the frost comes on, and keep them in a warm dry room. This is my method, and I have now several large ones in my house, in a fine state of preservation; and my neighbor, Mr. Davis Lightner, one of your subscribers, has them two years old at this time, weighing 43 lbs. each. They are very fine. *Farmers' Cabinet.*

MR. STEENROD'S FARMING.

Correspondence communicated for publication in the Farmers Register.

To Daniel Steenrod, esq.

Washington City, D. C.
December 31st, 1887.

I received your kind favor of the 28th, giving, as I requested you, some account of your last crop of wheat, which seems to have been so very fine. You mention the profit per acre; but did not mention the price per bushel, the number of bushels, nor the extent of ground.

As I am informed that you are a farmer, in fact, and have made your estate by that means; (not a farmer in theory, who has spent a fortune

in experiments,) I would be much obliged to you to give me an account of your farm and mode of farming, product, stock, &c. especially whether the lands be high or low, subject to inundation or not.

As I may wish to give the 'Farmers' Register' the benefit of it, as well as myself, I would be pleased that it be as particular and minute as may be, without reasons or arguments; but only the facts. If it should go to the 'Register,' enough argument will, of course, be raised over it afterwards. As to myself, I care little about the reasons—I want the crops.

Very respectfully, your most
Obedient servant.
JAMES W. BOULDIN.

Washington City, D. C.
January 2d, 1838.

Hon. J. W. Bouldin,

Dear Sir—The interest which you evidently take in the practical operations of farming, and the regard which you entertain for "the farmer in fact, and who has made his estate" in that way; "not a farmer in theory, who has spent a fortune in experiments," heightens the pleasure with which I sit down to answer your note of the 30th ultimo. All I profess to know, is farming, and that from an experience of forty years, without any information derived from books upon the subject. At a very early age, I was left entirely dependant upon the world, and all I have, is the fruit of my own care and diligence in *farming*.

My farm is divided into first and second creek bottom, and hill, intersected by Wheeling creek; the bottom land approaching within a half a mile of the Ohio river, the hill land considerably nearer. The hill land is very finely adapted to grass, and is generally used for grazing: this land will run into natural grass in a few years, of that kind usually known with us as "blue-grass." This portion of my ground I seldom work; but when I do, the crops are corn, sometimes oats, and then wheat with timothy; clover in the spring. I mow it two or three years in succession, and then use it exclusively for pasture until the timothy and clover are rooted out by the natural grasses, and the stiffness of the sward requires tillage, which happens in six or seven years, then I plough it up and pursue the same round. This land I have never manured, and have never seen the necessity of doing so. This hill land is generally a rich black loam, or limestone, and some sandstone strata lying horizontally, and occasionally appearing at the surface, but not to incommode the farming operations.

The second bottom is a stiffer soil, not so rich as the hill land: this land requires manure. My first crop is corn; then oats; then wheat with timothy, and in spring, clover. This is kept in meadow two or three years, then one or two years in pasture, and then my crops in rotation.

The first bottom is a deep, rich, black, soil. This portion is occasionally inundated and when this is the case, the crops are much heavier; the inundation having no current, owing to the black-water from the Ohio river, a rich deposit is made varying to two inches. This ground I do not manure, unless occasional spots. This ground I generally work in the same manner as the other, sometimes taking off two crops of corn in succession. I keep no more stock than what is necessary for my own convenience, in carrying on the farm and sustaining the domestic operations; but being located near the city of Wheeling, I take in for grazing *(agist)* as much stock as I deem necessary, and which is more profitable to me than keeping stock of my own; this stock runs on my old pasture grounds, reserving my meadows after harvest, for the numerous droves of cattle, which pass along the great thorough-fare of the national road.

I commence my ploughing as early in the spring as possible, and which is done with crane ploughs, turning deep in proportion to the soil, harrow twice, then in the last of April or first of May, as the season permits, plant my corn in light cross-furrows, from three and a half to four feet wide. On the hill-sides I plant my corn further apart, and sow less small grain to the acre; for on level land, furrows four feet wide will do, while on a steep hill-side furrows measured four feet on the surface will not be *near* four feet wide in a straight line between the grown corn. If time and circumstances admit, I cut my corn off, and either haul it off, or shock it up in rows. The next spring, as soon as the season will permit, (which requires some knowledge of the particular climate,) I sow about one bushel and a half of oats to the acre on the naked ground, and then with crane ploughs put them in shallow, say three or four inches; if the ground is very light, I merely brush it over with a small brushy tree-top; but if the ground is hard, I harrow in the same way I plough, and if I want clover as the principal grass, I now sow the seed, mixed, however, with a little timothy, and brush it lightly. If I do not want the ground put *down*, I reserve it for wheat. After having turned in stock and grazed it as bare as possible, I plough it once, deep; and having sown my grain, harrow it twice, on ground which does not throw or *spew* out with the frost; but if the ground is liable to this, I prefer harrowing the ground after it is ploughed, then sowing my grain, and ploughing it in lightly. If I do not wish to put it down, I leave it so; and next fall pursue the same process, and then put it down in grass as before stated. When I sow grass seeds in the spring I put four quarts of clover and one quart of timothy seed to the acre, mixed together and sown at once; in the fall I sow four quarts of timothy seed to the acre, and the next spring a quart or three pints of clover seed.

The abundant crop of wheat to which you allude, grown by me the past season, I managed somewhat differently, I first put the ground in corn as usual, and early in the fall (as soon as the corn was hard enough) I cut it off and cleared the ground, and applied a very heavy harrow and smoothed it all down, and then sowed my wheat at the rate of one bushel and one peck per acre, then with crane ploughs covered it about four inches deep; then brushed it all level, and sowed on this timothy seed. This was on a first bottom; this crop I thrashed from the shock and sold to Mr. Penkin, who kept an account of the aggregate amount of wheat and of the proceeds of sale. He considered the crop so abundant that he measured the field and made the calculation and published the statement, which you have seen, averaging the crop at $68 per acre; the wheat was one dollar per bushel; the flour $6 50 per barrel.

The straw was bound in bundles and sold for $12 per acre in Wheeling. I also had a large field of second bottom this last season of which no account was kept, nor any admeasurement made, and which was but little inferior to the other. My oat crop yields from fifty to eighty bushels per acre; the corn from sixty to one hundred and thirty-one bushels per acre, which I had this last season; the meadows yielded from two to four ton per acre, all depending on season, &c.

I apply my manure generally in the fall immeately after harvest and well rotted. It is hauled out and thrown in piles and so remains until spring, when it is spread out and the ground broken up for corn.

Any information, I can give you, will at all times be cheerfully afforded. I leave the reasons to others, and detail only facts, of which thus far *I have no reason to complain.*

Respectfully, your
Obedient servant.
DANIEL STEENROD.

From the last edition of the Complete Grazier.

ON THE DISEASES OF CATTTE.

Diseases incident to cattle in general.

The brute creation are, in general, liable to fewer maladies or complaints than mankind; and, as their diseases are less complicated, they are, of course, more easily to be relieved: yet among the various phenomena in the history of man, it is not the least singular, that the treatment of sick cattle has hitherto been confined chiefly to the most illiterate and ignorant peasants—men equally unacquainted with comparative anatomy and with the relative powers of medicine. Hence many thousands of valuable beasts have necessarily perished for want of that assistance which attentive observation, aided by sedulous inquiries, might have remedied, if not altogether prevented.

Various, indeed, are the maladies, to which cattle are liable; and though constant and careful examination of their health will greatly contribute to the prevention of diseases, yet it will frequently happen that they become sick either from the effects of our variable climate, or from causes which all the vigilance of the farmer cannot possibly control. It would greatly swell the limits of the present work, were we to enumerate every malady incident to cattle; we shall, therefore, confine our attention to a few of those which are of most common occurrence, and for the rest can with confidence refer the farmer to Mr. Clater's useful work on the Diseases of Cattle—the result of forty years' practice and experience. But it cannot be sufficiently impressed upon the owner of cattle, that in all sudden cases, it will be his real interest promptly to call in the aid of some expert cattle-doctor.

Colds are frequent attendants in the rearing of numerous animals, and are too well known to require any minute description. In these affections, as in every other malady, prevention is preferable to cure; it will, therefore, be necessary to preserve cattle from undue exposure to sudden blasts of wind, particularly from the north-east, and not to suffer them to lie in wet pastures; and particularly in those seasons when fogs are prevalent; as, by chilling the surface of the body, they cause an undue determination of blood to some internal organ, which, not unfrequently, terminates in acute inflammation. The lungs and bowels are more liable to suffer from cold and wet than any other part of the body, and hence it is that colds often lead to diseases of these parts. When they become confirmed, or settle on some internal part of the body, the affected cattle may be easily discovered by the hollowness of their flanks, the roughness of their coats, the running or weeping of their eyes, and the heat of the breath. Colds prevail chiefly in the brute creation, as among mankind, in those springs which follow mild winters; and as they become contagious if long neglected, the diseased beasts should be selected as early as possible, and separated from the rest of the herd. Formerly it used to be the practice to keep beasts affected with colds as warm as possible, and no doubt many have fallen sacrifices to this very improper mode of treatment. Unless sweating can be excited, the warm atmosphere in which animals were kept, only tended to increase the inflammation which is ever an attendant on a cold; and thus the disease, which at first was confined, perhaps, to the windpipe, has extended to the lungs, and has either produced inflammation of the membrane lining the aircells, or of the substance of the lungs themselves. As those medicines generally termed sudorifics are not always, indeed seldom, found to excite sweating in animals, they, of course, never can be relied on for producing that effect; and, therefore, it is better to keep the beast affected with cold in such a situation as that he may breathe a perfectly pure and cool, air without being exposed to draughts, or wet; and, in order to relieve the lungs and other parts of the body from the load of blood they are forced to receive on account of the contraction of the capillary vessels, from two to four or more quarts of blood may be drawn, according to the urgency of the symptoms, and a clyster, made of six ounces of Glauber's, epsom, or common salt, dissolved in three or four quarts of warm water, or thin gruel, with four ounces of oil, may be thrown into the rectum; after which the beast may be curried or well wisped, in order to excite the circulation of the blood in the cutaneous vessels. This mode of treatment may be repeated, if the breathing become laborious, and the inside of the eyelid be of a bright red. If the bowels be inflamed, the beast will evince symptoms of great uneasiness, lying down and rising up directly, rolling on its back, kicking its belly, and smelling its flanks. The same treatment is necessary as for inflammation of the lungs, and as it is often difficult for an inexperienced person to distinguish between inflammation of the bowels and flatulent colic, it is always better to give the above clyster, than to administer stimulants, which are often highly dangerous in the hands of the ignorant. The symptoms of the two diseases are much the same, but the pulse is different, and in colic, the florid redness of the inside of the eyelid is wanting. Before the clyster is given, it is a good plan to remove, by the hand, any hardened fæces that may be lying in the rectum. The drink ought to consist of water, in which nitre is dissolved.

The *colic*, or *gripes*, may be ascertained by the restlessness of the diseased animal, which rises up and lies down almost incessantly, continually striking its head and horns against any object that occurs. Young cattle are chiefly affected by the colic; which is attended either with *scouring* or

with *costiveness*, and which, of course, must be treated according to those two circumstances. In the former case, there is generally an acid in the stomach, which should be corrected by the administration of about an ounce or more of magnesia in a quart of tepid water; and this should shortly be followed by a dose of castor oil. Should the scouring continue after the proper use of purgatives, and the coat be staring and rough, the animal should be housed; its diet should be nutritive, and wheat-flour gruel, with a drachm of laudanum, if necessary, should be given three or four times a day. The following astringent drench should also be administered:—

Powdered catechu and fresh ditto allspice, of each two drachms; powdered carraways, half an ounce; good ale or red wine a pint.

When the colic is accompanied with costiveness, the following purge should be given as early as possible:—

Dissolve from *four* to *six* drachms of fine Barbadoes aloes (according to the size of the beast, and the urgency of the case) in two quarts of water-gruel, and administer the draught in a lukewarm state, and give the clyster recommended in colds.

In both cases, great and speedy attention is necessary, to prevent inflammation of the intestines, which must otherwise prove fatal; the beasts should also be kept dry.

Foul.—This disease affects the feet of cattle, chiefly in consequence of hard driving, where they travel through much dirt, and is generally caused by gravel, or some other hard substance getting between the claws. The part affected must be cleansed by washing, in order to discharge the offensive matter contained in the clees, or claws; after which they should be dressed with a mild digestive ointment, and kept perfectly clean from all filth, or other extraneous articles. Should, however, ulceration supervene, some local stimulant may be applied, and the part should be dressed with a saturated solution of alum, or, if that be insufficient, with a solution of blue vitriol. If the disease spread under the horn, this must be freely pared away, and the part dressed with some mild caustic or detergent ointment, according to the state of the parts. A laxative drench may be given where there is costiveness, and, if the local irritation induce fever, from two to four quarts of blood may be drawn from the jugular vein.

Hoven.—No distemper is of more frequent occurrence among cattle than that of being swollen, *blown*, or *hoven*, as it is usually denominated by farmers. It is induced either by too sudden removal from an inferior to a rich pasture, or by eating too eagerly of turnips, clover, or any other succulent food, especially before the dew is off in the morning; thus the stomach is loaded with food, and the process of rumination, or chewing the cud, being prevented, decomposition takes place, gas is generated, and the animal becomes swollen with confined air, which distends the stomach and intestines. Its preventive is obvious, and consists simply in turning cattle into such rich pastures only when they are not pressed by hunger, so that their appetite may be soon gratified; or they should be gently driven about for a few hours, that the dew may not only have time to evaporate, but also the animals being thus suffered to graze a very short time at once, the stomach will become gradually accustomed to it.

Various remedies have been tried and recommended for this malady, which, if not opportunely discovered, frequently proves fatal. Of these, the most common is to make an incision with a pen-knife, into the rumen at that part where it projects most, (that is, on the left side, between the last rib, and the haunch bone,) when a quill, or small tube of ivory or smoothed elder, is introduced in order to give vent to the confined air; the wound is then covered with adhesive plaster, to prevent it from being affected by the external cold, and thus the danger is in general quickly removed.

The method here noticed appears to be the result rather of absolute necessity than of mature thought, though sanctioned by custom; and, as it is liable to be attended with fatal consequences through the ignorance or inexpertness of the operator, it becomes necessary to resort to more easy remedies. Medicines, indeed, are seldom of any particular service, on account of the distance to which country people are often obliged to go, in order to procure them; but the following recipe, (which we communicate from Mr. Young's 'Annals of Agriculture,' vol. xxxiii,) being composed of simple, cheap, and common ingredients, promises to be useful. Let three quarters of a pint of olive oil, and one pint of melted butter, or hog's lard, be mixed together, and given to the animal by means of a horn or bottle; if no favorable change be produced in a quarter of an hour, the same quantity may be repeated. This dose is calculated for neat cattle: for sheep, when hoven or blown, a wine-glass full and a half, or two glasses, will be sufficient to be given in like manner. And it is asserted in the communication above cited, that this remedy is a specific for the malady in question, effecting a cure within the short period of half an hour. We know not whether this be really the case or not, and are certainly at a loss to account for its *modus operandi*; added to which, where the stomach is greatly distended, the dose is too large, and must greatly aggravate the symptoms if not speedily beneficial. Carminative medicines, as ginger or other spice, strong spirit and water, or peppermint water, are frequently efficacious in the beginning of the complaint, and often suffice without any other remedy. A laxative clyster should be administered, and the beast be made to walk about. Perhaps well wisping the paunch may assist in procuring an evacuation of the confined air.

Various instruments have likewise been contrived, with the view of relieving hoven cattle, two of which merit to be particularly noticed. The first of these is a flexible, metallic tube, invented by the celebrated professor of anatomy at Edinburgh, Dr. Monro; by whom it was announced to the public in 1793. It consists of iron wire, about one-sixteenth of an inch in diameter, twisted round a polished iron-rod three-eighths of an inch in diameter, in order to give it a cylindrical form; the wire, after being taken off, should be covered with soft, smooth leather. To the end of the tube, which is intended to be passed into the stomach, a brass pipe, two inches long, of the same size as, or rather larger than, the tube, is to be firmly connected; and, to prevent the tube from bending too much within the mouth or gullet, an iron-wire

one-eighth of an inch in diameter, and of equal length with the tube is placed within it, and withdrawn when such tube has entered the stomach.

Dr. Monro has found, that the distance from the fore-teeth to the bottom of the first stomach of a large ox is about six feet; the tube ought, therefore, to be six feet, or two yards in length, in order that it may operate effectually with the largest oxen. When the tube has entered the stomach, it may continue there for any length of time, as it does not impede the respiration of the animal. The greater part of the confined air will be discharged through the instrument; and, in case it should be thought necessary, the remaining condensed air, or the superfluous moisture in the stomach, may be absorbed thence, by fixing a bellows to the upper end of the tube, with two valves, one at the muzzle, the other at the side of it, and so disposed, as to allow the air to pass in the direction from the stomach upwards. At the same time, should it be deemed advisable to inject any ardent spirits, or other liquor calculated to check the fermentation, that operation may be performed with the utmost safety through this tube.*

Equally useful with the flexible instrument of Professor Monro, is the instrument invented by Mr. Eager, for relieving hoven cattle and sheep; for which the Society for the Encouragement of Arts, &c., in 1796, voted to him a premium of fifty guineas. * * * * * * * * * When any beast is swollen, or hoven, Mr. Eager directs a person to lay hold of it by the nostril and one horn, while an assistant steadily holds the tongue with one hand, and with the other pushes the cane down the animal's throat. Attention must, however, be paid, that the animal does not get the knob of the cane between his grinders, and that it be thrust to a sufficient depth, because its whole length will do no injury, and likewise that it be passed into the gullet, and not into the windpipe. As an obstacle will occur at the entrance of the paunch, the cane should be gradually pushed with additional force, and, as soon as a fetid smell is observed to issue from that place, and the body of the beast sinks, the cure is performed, and nature will complete the rest.

Mr. Eager, in his communication to the respectable society above-mentioned, adverting to the cause of this disorder, attributes it to the superabundance of air introduced into the stomach by eating too large quantities of succulent food at one time, which occasions a more than usual portion of air to ascend from the paunch of the beast. This forces the broad leaves before the passage at the end of the stomach, and these leaves prevent the wind from passing upwards in its regular course; consequently the paunch begins immediately to swell; the air becomes rarefied by the heat of the body, so rapidly as to impede the circulation of the blood; and the beast, whether ox, cow, bullock, or sheep, inevitably expires, unless speedy relief be procured. It only remains to add, that Mr. Eager's plan and instruments have been sanctioned by the Earl of Egremont, as well as by several eminent farmers, who have attested their efficacy in relieving blown or hoven cattle.

* Much further information on this subject may be found in Marshall's Works, and the Transactions of the Society of Arts.

Cheap and economical, however, as both these useful contrivances confessedly are, yet as *two* persons may not always be on the spot, to give relief to the animal, it becomes important to have recourse to other more portable and prompt mechanical assistance that may be given by one individual. For this purpose, Mr. Mason (of Goodrest Lodge, near Warwick,) in a communication to the Society for the Encouragement of Arts,* advises the use of the trocar and canula commonly employed by surgeons, for the relief of hoven cattle; and to penetrate with the trocar and canula through the beast's hide, to the paunch, on the near side, about six inches from the backbone, at an equal distance from the last rib, and from the hip-bone. The trocar is then to be withdrawn, and the canula left in the wound, until the air has escaped from the paunch, when the canula may be taken out, and the wound covered with a plaster of common pitch, spread on leather, about the size of a crown-piece. Mr. Mason states, that this operation is neither injurious to feeding oxen, nor even dangerous to cows in calf; and that it has been found particularly efficacious in preserving young calves when afflicted with this disorder, which proves fatal to numbers of them.

The very frequent occurrence of the disease now under notice, will justify the length at which we have treated its proposed remedies; on the efficacy of that suggested by Mr. Mason, no doubt, we think, can be entertained. Its superiority over other modes of treatment is very great, as it may be at all times applied with less risk than stabbing with a pen-knife; and, certainly, with less delay than waiting for assistance to apply the flexible tube. The size of the trocar also renders it a convenient instrument, to carry in the pocket at all times, when cattle are feeding upon clover; and the operation can scarcely be performed in such a manner even by the most ignorant servant, as to be attended with danger to the life of the animal.

Looseness or *scouring*, equally affects oxen and cows, though its causes in both are different. In general, it arises either from want of sufficient food, both in quality and proportion; from being over-heated or over-worked; by feeding on wet, unwholesome fog, or after-grass; or on bad hay and straw; and by not being lodged in dry situations; though it is sometimes an hereditary taint, and in cows is caused by their taking cold while calving. But whatever be the cause, as soon as the scour or lax begins to appear, (and it may be easily known by their general debility and loss of flesh, and the increasing paleness of their eyes, and irregular beating of the pulse, weakness of appetite, and frequent discharge of slimy excrement,) it will be necessary to house the beast, and put it to dry food; which, in early stages of the disease, will mostly effect a cure. Should the looseness increase, a pound of mutton suet, boiled in three quarts of milk, till the former is completely dissolved, may be given in a lukewarm state, which will contribute to allay the soreness necessarily occasioned by the continual irritation of the abdominal vessels. Or, in cases of obstinate scouring, the following drink may be beneficially administered:—

* Transactions of the Society of Arts, &c., Vol. XXVI, pp. 128—131. For this communication, the Society presented Mr. Mason with their silver medal.

Let half a pound of grossly-pulverized tormentil root be boiled in two quarts of water, till this is reduced to one quart; strain it off, add a quart of red wine, a quarter of a pound of finely-powdered chalk or whiting, and two ounces of diascordium, without honey.

This mixture should be preserved in a bottle for common use, and well shaken together; it will be proper to make it lukewarm before it is given. The dose is half a pint, to be administered three times in the day, at nearly equidistant periods till the beast recovers. Or, in similar cases, the following preparation may be given with equal, if not superior advantage:—

Boil half a pound of pulverized common chalk in two quarts of water, till the latter is diminished to three pints; then add four ounces of hartshorn shavings, and one ounce of cassia, stirring the whole carefully. When the decoction is cold, add two drachms of Thebaic tincture, or tincture of opium, and one pint of lime water.

The whole should be kept closely stopped in a bottle, being well shaken before it is used: the dose is one or two hornfuls, to be administered two or three times in the course of the day, as the nature of the case may require. But where an hereditary *taint*, or *debility*, is the immediate cause of the scouring rot, as this malady is sometimes termed, it will baffle all the powers of medicine.

The *Pantas*, *Panting-evil*, or *Pantasie*, prevails chiefly during the intense heat of summer, though it is sometimes occasioned by sudden colds. It may be easily known by the panting, or heaving, of the animal's flanks, which is likewise accompanied by trembling and decay of flesh. In the treatment of this disease, it will be necessary to house the beast, and to give him every six hours (during the continuance of the chilly symptoms) one quart of warm strong beer, in which one table-spoonful of laudanum, a similar quantity of ground or grated ginger, and two table-spoonfuls of spirits of hartshorn have been previously infused. His food should consist chiefly of sweet, dry hay, with warm water, in which nitre may be dissolved, if a fever be approaching; and the animal should be well littered with abundance of straw. As he gains strength, he should be gradually accustomed to the air, and after a short time will be fully recovered.

Poisons.—While grazing abroad, cattle are subject to a variety of casualties or accidents, by eating the leaves of yew, various species of crowsfoot, and other acid plants, as well as by bites from mad dogs, or venomous reptiles. In the former case, the most effectual practice consists in drenching the animal with a mixture of equal parts of lukewarm salad-oil and vinegar, afterwards giving a gentle purgative of Glauber's salt, or Socotrine aloes; and, if the viscera appear preternaturally distended with air, by administering a trepid infusion of tobacco in the form of a clyster. With regard to bites of mad dogs, the only certain remedy is to eradicate the lacerated part, either by excision or by the actual cautery, the wound being kept open for a considerable time; but in cases of bites by serpents, or vipers, we know of no better remedy than the continued and copious use of spirits of hartshorn, both as an application to the part affected, and also internally as a medicine.

Red Water, or *Bloody Urine.*—The name of this malady sufficiently indicates its nature, so as to render a specific description of it unnecessary; it may be easily discovered, in recent cases, by the animal's making frequent but fruitless attempts to discharge urine; but when they make much and frequent, with a considerable effusion of blood, it is a dangerous symptom. Cattle thus affected, usually leave the herd; extending their tails, they apparently feel pain in the urinary canals, and not unfrequently set their backs up higher than common.

The red water chiefly attacks young beasts, and is caused either by sudden changes of weather; by bad or coarse food; and likewise by bad or stagnant water.

As soon as a beast is discovered to void blood, it should be conducted to a warm, dry shelter, and kept on good hay, or similar dry food. This disease may arise from two very opposite causes; the one, too great a determination of blood to the kidneys, by which some small vessels give way and pour out their blood; the other, a laxity and relaxation of the kidneys, which produce the same effect. In the first, the beast is generally fat and gross, and there will be manifest symptoms of inflammation, for which it will be proper to bleed and purge, and to restrict the animal to a low diet; carefully avoiding, however, the exhibition of nitre, so generally given in the fevers of cattle, but which, by determining to the kidneys, would greatly aggravate the complaint, and also allowing but a small quantity of water. In the last, styptics are necessary, and we would, therefore, recommend a strong decoction of Peruvian bark, (for which oak bark may be substituted if necessary,) in which a small quantity of alum has previously been dissolved. The dose may be two or three hornfuls, to be given twice or thrice in the day, at nearly equidistant periods, accordingly as the violence of the disease may require.

The *Staggers.*—This disorder is variously known by the names of the daisy, dizziness, epilepsy, lethargy, turning or vertigo, that sufficiently indicate its symptoms, the chief of which is a lethargic drowsiness, accompanied with a wavering, unsteady, and staggering gait. The seat of this malady is either in the *brain* or in the *stomach;* in the former case, it is usually produced by hydatids, or small transparent bladders filled with water, or by some other matters immediately acting upon the brain. Where this is the cause, medicine can afford no assistance whatever; but we remember an instance of epilepsy which occurred many years since, where this formidable disease was cured by the operation of *trepanning*, which was performed by Mr. Cheston, an expert surgeon, then residing at Gloucester, and has since been practised in many cases with success. But where the staggers is caused by plethora, or too much fulness of blood, bleeding, and cooling purgative medicines should be resorted to; and, as it is necessary to confine the beast in a warm stable or shelter, it will greatly contribute to promote the circulation, thus necessarily stagnated for want of exercise, by rubbing him every day with dry straw, and allowing him plenty of litter to promote perspiration.

In the *mad staggers*, (which disease, however, is chiefly noticed in horses,) the animal throws itself about with the greatest violence, and exhibits

every symptom of inflammation of the brain, which is, in fact, the proper name of the disease. Bleed till the animal faint, and give laxative drenches and clysters, repeating the bleeding if necessary. The diet must consist of bran mashes.

This species of staggers is frequently caused by an over-loaded stomach, and is then called *stomach staggers.* The distension of this organ is sometimes so great, that its powers are completely destroyed. In this case, purgatives with stimulants are the proper remedies; as the following:—

Take	Calomel - - -	3 drachms.
	Carbonate of ammonia	2 drachms.
	Ginger - - -	3 drachms.
	Aloes - - -	6 drachms.
	Syrup, as much as necessary.	

Wounds.—Cattle, in general, are subject to a variety of accidents, which the limits of our work forbid us to specify, and which, indeed, are so numerous, that it is scarcely possible for human foresight to provide for every contingency. Hence our remarks will be confined to the most appropriate remedies for punctures, bruises, or common wounds.

In cases of common, fresh wounds, nothing more is necessary than to apply a salve, consisting of white lead, and oil of terpentine, incorporated together with a little brandy, to the lips of the cut, which should be drawn as closely together as possible; and carefully to exclude the air. But if the laceration be deep, it must be washed with warm milk and water; after which, the wound may be filled with lint or tow, dipped in a digestive ointment, composed of Venice turpentine and balsam of capaiba, or capivi, of each one ounce, with two ounces of yellow basilicon. The wound must, as in the former case, be kept from air and dirt, or its healing will be materially retarded.

The following remedy has been recommended as a certain styptic for fresh wounds: Bruise equal parts of stinging nettles and salt in a mortar, till a pulp or mash is formed, and apply it to the wound; the bleeding of which, it is asserted, will *immediately* cease, however deep or dangerous such wounds may be. Not having had experience of its efficacy, we cannot vouch for its utility; but as the articles are always at hand, this specific, if such it be, certainly deserves a fair trial. Where, however, an animal has received any blows or bruises, without breaking the skin, it will be sufficient to bathe the part affected with camphorated spirit of wine; but if the swelling become inflamed, it will be requisite to make a slight incision below the contused spot, in order to promote suppuration, after which the following salve, or plaster, may be applied:

Let frankincense and Venice turpentine, of each one ounce, be gradually incorporated over a slow fire, with two ounces of Burgundy pitch; and, when of a proper consistence, let a sufficient quantity be spread upon a pledget of tow, or strong linen rag, and well fastened on with a bandage.

As soon as the wound begins to discharge the matter freely, the digestive ointment and treatment just mentioned, may be adopted. Lastly, should any swellings or local humors arise, without the beast receiving any external injury, or if the skin should be very slightly bruised, they will be effectually removed by rubbing the part affected repeatedly with the hand, copiously moistened with Goulard's mixture, which is prepared by adding two tea-spoonfuls of extract of lead, and one large spoonful of strong camphorated brandy, to one pint of water; the whole is to be well shaken together, and set apart for use.

On the diseases peculiar to Oxen and Cows.

Oxen are subject to few maladies, exclusive of those incident to neat cattle in general, unless the effects produced in these animals by the ox-fly, breeze, or gad-fly, as it is variously termed (the *Estrus bovis* of Linnæus.) This insect has spotted wings, and a yellow breast; it is furnished with a long proboscis, armed with a sharp dart, inclosing two others within it. The gad-fly particularly infects oxen, in the backs of which these insects deposite their eggs, and in which the maggots are nourished during the month of June; throughout the summer they plague the cattle by means of their darts to such a degree, that they are often induced to rush into the water for relief, till the approach of night. It has been suggested, that the production of these terrible insects might be greatly checked, if not prevented, by washing oxen and cows (which are sometimes attacked by these vermin) in the spring, with a decoction of tobacco, or any other bitter and acrid vegetable.

Garget of the limbs and of the maw.—In the first disease the animal walks with pain and difficulty, the coat is staring, and the respiration labored. The joints are also heard to crack on being moved. Bleed, and after the operation, give a purgative drench composed of camphor, two drachms; tincture of opium, half an ounce; balsam of capivi, one ounce; ale, two quarts. Keep the animal dry and quiet.

In the second disease, there is always great costiveness and accumulation of hard excrement in the third stomach. The symptoms are heaviness, langor, loss of appetite, and hard dung. Give the following purgative:

Barbadoes aloes, - -	½ an ounce.
Common salt, - -	4 ounces.
Ginger, - -	2 drachms.
Carbonate of soda, - -	½ an ounce.
Water, - - -	1 quart.
Gin, - - -	4 ounces.

Mix for one drench, and assist its operation by throwing up a clyster made of one gallon of warm water or thin gruel and six ounces of common salt, with from four to eight ounces of oil.

Cough or *Hoosing.*—This disease may be easily known, by the shortness of breath and difficult respiration that invariably accompany it. Sometimes it arises from extraneous matters adhering to the throat, which, resisting the powers of mastication, produce an unusual tickling in that part; but more commonly it originates from cows taking cold while calving. A regular supply of sweet, succulent food, together with warm housing, (especially during the winter,) is the only certain remedy that can be depended upon in this case; though some have recommended one ounce of pulverized aniseed, a similar quantity of tar, and of vinegar of squills, to be infused in a quart of warm ale, sweetened with honey. With this liquor the animal must be drenched every day for

several weeks, otherwise no beneficial effects can be expected to be derived from such treatment.

The *Milk Fever* is chiefly occasioned by cows taking cold while calving. Hence it becomes particularly necessary to watch them when near their time, as many valuable beasts are lost for want of due attention to this circumstance. Cows thus affected should be taken immediately into the house; they should be allowed plenty of dry litter, and in other respects generally treated as in the case of violent colds; except that no blood must, on any account, be drawn, unless in cases of extreme necessity.

Affections of the Udder.—The udders of young cows, that are in high condition, are sometimes greatly swollen and inflamed for several days before they calve, in which case it will be proper to milk them repeatedly, and to anoint the distended udders with cooling ointment or olive oil. Beside these swellings, the udders of cows are liable to injuries, which are often of serious consequences, by falls, blows, wounds from sharp or pointed instruments; by the violent sucking of calves; and also from the injudicious or rough treatment of harsh or inexperienced milkers. While the inflammation remains in an indolent state, the parts affected ought to be repeatedly anointed in the course of the day with fresh butter, or with a salve, consisting of one ounce of castile soap dissolved in one pint and a half of new milk over a moderate fire, constantly stirring it till it be thoroughly incorporated. An ointment, prepared from the juice of the leaves of the common thorn-apple, (*datura stramonium*, of Linnæus,) mixed with hog's lard, is likewise said to be an excellent application for swollen udders; or, the tumor may be anointed with a little mixture, consisting of camphor and blue ointment, about half a drachm of calomel being given in a hornful of warm beer, for three or four mornings, if the malady continue to increase. Where, however, the udder and teats are considerably inflamed, internal remedies should be resorted to: for this purpose it has been recommended to mix four ounces of nitre with one pound of common salt, and to give two tablespoonfuls of the powder in a gallon of thin water-gruel every three hours.

But in case the disorder should, from neglect, have made such progress as to exhibit hard tumors, the following fomentations may be applied: let one handful of common hemlock (*conium maculatum*, L.), a similar quantity of the dwarf or round-leaved mallow (*malva rotundifolia*, L.), and the same portion of common meliot (*trifolium meliotus officinalis*, L.), be boiled in a sufficient quantity of water, and diligently applied, as warm as the beast can bear it. As soon as the tumor opens, let the sore be properly cleansed, and then cover it with a plaster of Turner's cerate, or of basilicon ointment. The following remedy has also been successfully employed in obstinate cases of ulcerated udders, viz:

Take gum ammoniac and gum galbanum, castile soap, and extract of hemlock, of each one ounce; form them into eight boluses, one of which should be given every morning and evening.

Lastly, where the teats only are sore, they may be washed with clean, warm soap suds, and rubbed with an ointment consisting of pulverized ceruse, or white lead, that has previously been saturated with brandy, mixed with a sufficient quantity of goose grease, or elder ointment, or with the following mixture:

Olive oil,	-	-	-	3 ounces.
Oil of turpentine,	-	-		1 ounce.
Camphor,	-	-	-	2 drachms. Mx.

Such are the diseases incident to cattle, that are of most ordinary occurrence: for an account of the more dangerous maladies of inflammations of the liver and lungs, locked-jaw, yellows or jaundice, &c., we beg to refer our readers to Mr. Clater's work entitled "*Every Man his own Farrier*," already noticed: and for instructions in cases of difficult birth, to that of Mr. Skellett, "*On the Parturition of the Cow.*"

On the Diseases of Calves.

Scouring or *Looseness*, is generally the first malady that attacks calves; it is mostly, if not entirely, occasioned by the inattention of the persons to whose care the sucklings are committed, and who often put them too soon to suck, allowing them to remain longer at the teat than is proper: too frequent change of milk will likewise produce this disease. As soon as the looseness is discovered, it has been recommended to stint the calf in its diet, and to give an egg, boiled hard and chopped small, by drenching, fasting; the use of which, once or twice, is asserted in most cases to effect a cure. A mixture of pulverized chalk and wheat-meal, with the powder of fennugreck, made into balls with gin, or strong ale, has also been recommended as a medicine which may be administered with safety.

The *Shoote* is a most fatal malady to calves, which it generally attacks a few days after birth. The usual symptoms are, first, a colic that is more or less violent, and is frequently very severe and dangerous, especially when it is contagious. This colic is terminated, and the calf relieved by a discharge taking place from the bowels; though this sometimes proves fatal before the shoote appears. Secondly, a loathing and refusing of food, even previous to the discharge, which decreases and increases according to the duration and violence of the disorder. Where the *shoote* prevails, the cheapest, and perhaps the best medicine which has been generally administered by experienced breeders is, eggs and flour properly mixed with oil, melted butter, and aniseed, linseed, or similar mucilaginous vegetables; or, simply, milk well mulled with eggs, may be given to the distempered animal.

The *Cords* is a disease chiefly prevalent in Scotland, where it attacks calves during the first days, or weeks, after they are produced, and proves particularly fatal to such as are fed by hand and confined; though, if they outlive five or six weeks, they are seldom in any danger. The disorder appears to be of a plethoric and inflammatory nature, as the calves that die in consequence of it are extremely red; and the small leaders, or ligaments, are much contracted, whence probably the disease has its name. With the view to prevent the occurrence of the cords, it has been recommended to purge off the meconium, or first excrement, by giving the calf a little of the mother's milk, lukewarm, as early as possible, or with syrup of buckthorn, or rhubarb, care being

taken that no cold milk be given the animal for the first six weeks. And, in order to counteract or reduce the disorder, it will be advisable to turn them out every day for a few hours, as soon as possible after they are calved, in order that they may enjoy the benefit of full and free exercise in the open air; but where the weather or other circumstances may not allow this always to be done, (and especially as confinement is necessary to their speedy fattening,) the most effectual preventive will be frequently to take a little blood from them.

Cough.—Where calves are exposed at too early an age to *all* the vicissitudes of the weather, before they acquire sufficient strength to undergo the changes of this climate, they are liable to take frequent colds; the consequence of which is a *cough*, that often proves fatal if it be neglected. For curing this malady, it has been recommended to pour half a table spoonful of spirit of turpentine into the calf's nostrils, which must be held upwards, in order that the turpentine may flow into the throat: at the same time the nose should be smeared with tar, and the animal kept within doors or a few hours, repeating this treatment as often as the cough is troublesome.

3. The *Gut-tie*, chiefly prevails in the county of Hereford, where it is considered as the effect of an erroneous method of castration, which causes a stoppage in the bowels, and brings on a mortification that speedily proves fatal. The symptoms are a total stoppage in the bowels, except a copious discharge of blood and mucus, accompanied by a violent fever, which occasions the calf to kick at its belly, lie down and groan. The gut-tie mostly affects calves, though they may live to be full aged, and yet be liable to a sudden attack of this distemper. The manner in which a cure is effected in the county above mentioned, is, to make a perpendicular incision four inches under the third vertebræ of the loins, over the paunch, or stomach, and to introduce the arm, in order to discover the part affected, the beast being kept, if possible, in an erect position by the help of proper assistance. The following draught is given, in order to remove the stoppage of the stomach occasioned by the *gut-tie*, and to carry off the fever:

Senna, - - - -	1 ounce.
Cream of tartar, - - -	2 ounces.
Glauber's salts, - - -	4 ounces.

Infused in two pints of boiling water, with the addition of half a pound, or pint of salad oil, the whole being worked off with gruel, in which mallows and alder bark have been infused.

On the Diseases of Horses.

Of all domestic animals, the horse is, perhaps, more liable to disease than any other; and this is not to be wondered at, when we consider the toil he is frequently forced to undergo, the brutality with which he is often treated, the tender age at which he is very generally compelled to work, and the improper treatment he commonly meets with from those even who are most desirous of using him well, and who, in most instances, err through ignorance.

As in all cases of disease, we should recommend early application to be made to a skilful veterinary surgeon, it is not our intention to go into any very lengthened detail of the maladies of horses generally, but merely to give a summary account of the symptoms and treatment of the most common diseases to which these useful animals are subject, in order that the farmer may, on any sudden emergence, be enabled to detect the nature of the complaint which he has to contend with, and to administer those medicines most conducive to its removal.

Botts are short, thick, reddish worms, surrounded by small prickles, and are armed with two hooks or claws, by means of which they attach themselves firmly to the horse's stomach, where they frequently exist in such quantities as to cause many serious diseases, not only of the viscus in which they are lodged, but also of the brain and nervous system: with which the stomach is well known to sympathise.

These worms may occasionally be found sticking about the fundament, generally towards the close of autumn, or when a horse is first taken up from grass. Common oil, given fasting in doses of from half a pint to a pint, has been known to succeed in destroying these insects; but as good a method of getting rid of them as any, is to keep the horse fasting during the night, and in the morning to give him about a pint of warm milk, sweetened with honey; and, five or ten minutes after, a drench composed of one quart of warm water or thin gruel, and four or five ounces of common salt.

Several other species of worms exist in the bowels of the horse, and are not unfrequently met with even in the large blood-vessels. The most efficacious mode of destroying them, is to give one or two drachms of calomel at night; to keep the horse fasting, and in the morning to administer the following ball:

Barbadoes aloes, - -	5 drachms.
Ginger, - - -	1½ drachms.
Oil of Carraways, - -	15 or 20 drops.
Castile soap, - -	3 drachms.

Syrup enough to form the ball.

Or a drench made by dissolving four or five ounces of common salt in a quart of thin gruel, and three or four ounces of olive oil. Previous to physicking a horse, he should be kept on warm bran mashes for a couple of days; and care must be taken, after giving the medicine, that he be not exposed to cold or wet, or allowed to drink cold water. A run at grass is perhaps the best remedy for worms; and where this cannot be had, soiling on green food will be found beneficial. Oil of turpentine in doses of three or four ounces in a pint of gruel, is a very efficacious remedy for worms.

Colic is generally produced by an overloaded stomach; which, impairing the digestive process, causes a great quantity of air to be formed, which distends the stomach and intestines, and produces those symptoms hereafter to be noticed. It is also frequently induced by allowing a horse to drink cold water or hard well water, or by feeding him on new oats or hay. As this disease, (which is generally termed flatulent or spasmodic colic, gripes, fret, or gullion,) unless relieved, is liable to terminate in inflammation of the intestines, it may perhaps always be proper to bleed to the extent of two or three quarts; to unload the bowels as much as possible by hand-raking; and to administer a clyster made of half a pound or more of common

salt, and five or six quarts of warm water or gruel; to which may be added half a pint of olive oil. Then a carminative drench may be given; and gin and water, or brandy and water, are perhaps as good medicines as can be had for this purpose, and possess the advantage of being generally at hand. Four ounces of spirit to twelve of water, are the proportions in which they may be used; that is, one pint of spirit and water should contain one-fourth spirit and three-fourths water. Should the animal not appear relieved in the space of half an hour, the above remedies may be again resorted to with greater freedom.

The symptoms of colic are as follow: the horse appears restless and uneasy; frequently paws his litter; looks round at his flanks; endeavors to strike his belly; falls down; rolls on his back; gets up suddenly, and after a short time falls again, with other demonstrations of extreme pain. The mode of distinguishing an attack of colic from inflammation of the bowels, will be seen by referring to the symtoms of the latter complaint, under the head "Inflammation."

Cold or *Catarrh.*—This disorder is generally induced by exposing a horse to cold or wet, while in a state of perspiration. Its symptoms are dulness and watering of the eyes, cough, discharge from the nostrils, sore throat, quickness of breathing, general lassitude and accelerated pulse. (*A healthy horse's pulse beats from thirty-six to forty strokes in a minute.*) As catarrh is an inflammatory complaint, it is proper, in the first instance, to bleed largely: five or six quarts of blood may be drawn, unless the animal become faint before that quantity be abstracted. The diet should consist of bran mashes, containing a small quantity of nitrate of potash, (about half an ounce,) three times a day; and the horse should be kept in a cool stable, or loose box, or turned into a paddock. When the throat is very sore, an emollient drink, composed of decoction of marsh-mallows, or linseed with mucilage of acacia and liquorice, may be given. When catarrh terminates in chronic cough, the best remedy is attention to diet, exercise, and grooming. The horse should never be allowed to overload his stomach, especially with hay; his bowels should be kept moderately open by means of bran mashes or clysters, when requisite, and if the secretion of urine be faulty, it may be increased by small doses of nitre. A variety of medicines have been prescribed for chronic cough; as powdered squills, and gum ammoniac, one drachm of the former to three of the latter, made into a ball with castile soap, liquorice powder, and syrup; or a powder composed of two drachms of levigated antimony, the same quantity of nitre, and three drachms of powdered resin, to be taken every morning in a mash until it acts as a diuretic. The following drench may sometimes be found useful.

Take one ounce of bruised squills, three of garlic, and twelve of vinegar; macerate the squills and garlic in the vinegar for one hour in a moderately warm oven; then strain off the liquid, and add one pound of honey or treacle. Three or four ounces of this mixture may be given at a time in bad coughs; and when great irritation appears to exist about the wind-pipe, one teaspoonful of tincture of opium may be added to every dose.

Grease.—This disorder consists in a discharge of stinking matter from the heels. On its first appearance the horse should take a dose of physic, and be kept on bran mashes, containing a little nitre. The leg should be enveloped in a large, warm, emollient poultice; and this treatment should be continued until the pain attendant on the complaint be removed, after which the parts may be washed with a solution of blue vitriol. In very inveterate cases, requiring stronger applications, the following lotion may be used instead of the vitriol:

Corrosive Sublimate,	-	-	1 drachm,
Muriatic acid,	-	-	3 drachms,
Water,	-	-	1 pint.

When the disorder has been cured, there will generally remain some swelling of the part, for which bandages are the best remedy.

Inflammation.—Under the term inflammation, may be classed fever, or general inflammatory action of the whole system, as well that which is confined to particular parts, as the brain, lungs, liver, bowels, &c. In all attacks of inflammation, there is a quickened pulse, heat, and redness of the inner membrane of the eye-lids; the horse is generally dull, and unwilling to move, except in inflammation of the brain, or mad staggers, when he is extremely violent and dangerous to approach; the urine is in most instances scanty and high-colored; the dung voided in small knobs, frequently covered with slime. In addition to these general symptoms, the breathing is laborious and oppressed in cases of pleurisy or inflammation of the lungs, as may be seen by the heaving of the flanks, and the dilatation of the nostrils; and in inflammation of the bowels, the horse, besides manifesting signs of being griped, appears for some time dull and heavy, then becomes restless, as in cases of colic, his breathing is sometimes disturbed, his pluse quick, the inner surface of the eye-lid red, the extremities cold, and the appetite lost. If not speedily relieved, the griping becomes so severe that he breaks out into profuse sweats; and at length, mad with pain, becomes violent, and dangerous to approach. In all cases of inflammation, bleeding to a large extent, from six to eight quarts, according to the violence of the attack, is essentially necessary; and this, if the symptoms do not subside, must be repeated. The bowels should be hand-raked, a clyster injected, and a dose of physic administered with the usual precautions. Diuretic balls may also be occasionally given, when the disorder begins to give way, and the diet should consist entirely of bran mashes. When the inflammatory attack has been subdued, a run at grass is the best mode of recruiting the strength. In inflammation of the kidneys—which may be known by the horse constantly endeavoring to stale, without being able to effect any evacuation, or at most to void but a small quantity of high-colored, bloody urine, and by a stiffness of one or both hind legs—the treatment, in addition to the bleeding and purging already recommended, may consist in covering the loins with a fresh flayed sheep's skin, the wool side outwards, and giving emollient drinks, as decoction of marsh-mallows, with mucilage of acacia, or decoction of linseed with gum arabic. Inflammation of the bladder may be treated in the same way as inflammation of the kidneys; but it is not necessary to ab-

stract as much blood as in the latter complaint, nor is the sheep's skin requisite: its most prevalent symptom is a frequent emission of a small quantity of urine, which being of an acrimonious nature, causes acute pain.

Broken Knees.—The best application to broken knees, is a large poultice, until the inflammation be completely removed; after which the injured part may be covered with a paste made of equal parts of powdered alum and pipe clay, with sufficient water to reduce it to the consistence of cream. This should be bound on, and suffered to remain for two days, when it may be renewed. Should there be any flap of skin, it is to be cut off; for, being bruised, it will rarely unite. Gunpowder and hog's lard, or tar ointment, (made by boiling together equal parts of tar and tallow,) may be used to promote the growth of hair.

Bruises should always be poulticed, or fomented with hot water. A towel dipped in greasy water, is a good application.

Galls.—When a horse is galled by the saddle or harness, or when he is chafed between the arm and chest, an accident which frequently happens in travelling through muddy roads, the following lotion will be found serviceable:

Sulphate of zinc, - - -	1 ounce
Super-acetate of lead, - -	1 ounce
Water - - - -	1 quart.

Strains.—The best method of preventing the inflammation attendant upon a strain is immediately on the receipt of the injury, to bleed and wrap the injured part in a large poultice. The horse should then be physicked and kept to a low diet. Some people, instead of poultices, employ cold applications: as

Super-acetate of lead, - -	1 ounce.
Vinegar, - - - -	4 ounces.
Water, - - - -	1 pint.

Their effect is the same as the poultice; each tending to reduce inflammation. On the whole, we are inclined to give the preference to the poultice. When a strain is neglected for some time, and the inflammation had gone off, bleeding will be improper. Blistering, and, in some cases, firing must be resorted to. There are several sorts of strains; as strains of the back sinews, of the pastern joint, of the shoulder, loins, hip, &c.; but our limits do not permit us to give a detailed account of their different symptoms. The rationale of their treatment is in all cases the same.

Teeth.—Sometimes the grinding teeth of horses become worn in such a way as to wound the inside of the cheek, and prevent the mastication of their food. In such cases, the edges should be filed down, and the wounded cheek rubbed with salt.

Strangles.—This is a disorder which happens to horses between their third and fifth year. It consists in an inflammation of the tonsils, terminating in an abscess under the jaws, and, when it occurs at grass, is generally of a mild nature. The swelling should be poulticed until it breaks or becomes sufficiently ripe to be opened with a lancet. When the throat is very sore, some blistering liniment should be rubbed in, and, in severe cases, where inflammation of the lungs is apprehended, bleeding is requisite. The horse should be kept in a cool place.

Lampas.—This is a swelling of the roof of the mouth, and is caused by cutting the grinding teeth. It is a common practice with farriers to burn the swollen part with a hot iron; a cruel and unnecessary operation, arising from ignorance of the causes producing the complaint. If any thing be done to it, the swelling may be rubbed with salt, or a solution of alum; but the best thing is to keep the horse on mashes or other soft food for a few days, when nature will effect a cure.

The following prescriptions will be found useful on many common occasions:

Cordial diuretic ball.

Common turpentine, - - -	3 drachms.
Hard soap, - - - - -	3 drachms.
Powdered ginger, - - - -	1 drachm.
Do. allspice, - - - - -	1 drachm.

Liquorice powder enough to form a ball.

Diuretic powder.

Powdered rosin, - - - -	4 drachms.
Nitre, - - - - - -	4 drachms.

Stomachic ball.

Powdered gentian, - - -	3 drachms.
Do. ginger, - - - - -	½ a drachm.
Do. allspice, - - - - -	½ a drachm.
Carbonate of soda. - - - -	1 drachm.

Treacle enough to form a ball.

Or,

Powdered cascarilla, - - -	2 drachms.
Myrrh, - - - - - -	1 drachm.
Ginger, - - - - - -	½ a drachm.
Castile soap. - - - - -	1 drachm.

Syrup enough to form a ball.

Or,

Powdered columbo root, - -	¼ an ounce
Do. cassia, - - - - -	1 drachm.
Do. rhubarb, - - - - -	3 drachms.

Syrup enough to form a ball.

Cordial drench.

Good old beer or mild ale, - - -	1 pint.
Grated ginger, - - - -	1 drachm.

Expectorant ball.

Gum ammoniac, - - - -	2 ounces.
Powdered squills, - - - -	1 ounce.
Do. opium, - - - - -	½ ounce.
Do. ginger, - - - - -	2 ounces.
Balsam of sulphur, - - - -	4½ ounces.
Castile soap, - - - - -	2 ounces.

To be divided into twelve balls, and one to be given every morning and evening, in cases of severe cough, the bowels having been previously emptied by physic.

Friar's balsam.

Benzoin, - - - - -	1½ ounce.
Storax balsam (storax) - - -	1 ounce.
Balsam of tolu, - - - -	½ ounce.
Aloes, - - - - - -	2 drachms.
Rectified spirit, - - - -	1 pint.

Diaphoretic alterative.

Levigated sulphuret of antimony,	3 to 6 drachms.
Anise seed, - - - - - -	½ ounce.

Astringents.

Powdered catechu, - - - -	3 drachms.
Alum (purified) - - - -	3 drachms.
Powdered opium, - - - -	1 scruple.
Do. ginger, - - - -	1½ drachm.
Prepared chalk, - - - -	2 drachms.

Or,

Opium, - - - - - - -	½ drachm.
Powdered ginger and powdered oak-bark, of each, - - - - - -	½ ounce,

Blistering liniment.

Olive oil, - - - - - - -	4 ounces
Oil of origanum and oil of turpentine, of each, - - - - - -	1 ounce.
Fresh powdered Spanish flies, - -	1 ounce.

Liquid blister.

Powdered Spanish flies. - - -	1 ounce.
Boiling water, - - - - -	½ pint.

After allowing the mixture to stand for a day and a night, add,

Rectified spirit of wine, - - -	4 ounces.
Oil of origanum, - - - -	1 ounce.

Liniment for the thrush and canker.

Melted tar, - - - - - -	2 ounces.
Muriatic acid, - - - - -	3 drachms.
Verdigris, - - - - - -	2 drachms.

Mix and stir till cold.

Or,

Melted tar, - - - - - -	½ pound.
Strong sulphuric acid, - - -	1 ounce.

For further particulars, we refer with confidence to "*White's Farriery*, and also to his very useful "*Dictionary of the Veterinary Art.*"

On the diseases of sheep.

Sheep are subject to various disorders, of which, however, our limits allow us only to state those of most frequent occurrence; hence we shall, for the present, briefly remark, that it may be easily ascertained whether these animals are in health, or diseased, by their agility and briskness; the clearness of their eyes, which, as well as their noses, should be perfectly dry; by the sweetness of their breath; the coolness of their feet; regularity of perspiration; the fine pink color of their skin; soundness and firmness of their teeth; and by the uniform, unbroken texture of their wool.

Blindness.—This affection of the eye is produced by exposure to cold, particularly in too moist or too elevated situations; and is occasioned by long continued fatigue, which will produce it at any season of the year. It prevails chiefly in Scotland, where a cure is sometimes attempted by opening the angular vein of the eye, and holding the animal's head in an inverted position, so that some drops of blood may fall into the eye.* This moderates the increased action of the vessels of that part, which is the immediate cause of inflammation; and also the blood, being so admitted into the creature's eye will, in consequence of its mildness and warmth, produce emollient effects, which likewise contribute to promote a cure. This operation completely removes the white specks on the eye, and restores the sight; though some for this purpose pulverize a small quantity of glass, and blow it into the eye by means of a quill open at both ends, which, by its friction, wears off such specks or scales. "But the enjoyment of ease will infallibly cure them in a space of time proportioned to the fatigue they underwent before." †

The *blood* is a fatal malady to sheep, which often die suddenly in consequence of it: in less violent attacks the symptoms are, panting and heaving of the flanks, and standing still. It is produced by feeding on too succulent or moist pastures. The most effectual remedy is bleeding; after which the animal should be turned into a dry pasture, and a mixture of common salt and nitre with bran may be given to it.

Dunt.—This disease is variously known by the name of staggers, giddy, vertigo, turn, sturdy, and bladder on the brain. It is occasioned by a vesicular collection of water in the head between the *dura* and *pia mater*, and uniformly produces a continual giddiness. The violently pulling of sheep by the ears, which are afterwards cut off, is said to have effected a cure: but the most frequent remedy is that of *trepanning*; a hazardous operation, which can only prove successful in the hands of skilful persons. In Saxony, several of the sheep-owners keep their lambs in the folds during their first year; having remarked that such as are kept from the fields during that time, are very rarely attacked with this disorder. In Prussia, M. Lasteyrie states, that he had been assured, by many agriculturists, that they had secured their flocks from the disorder, by fastening a linen cloth covered with pitch on the heads of the lambs, previously to conducting them in the fields. This kind of cap, they maintain, prevents the intromission of the worm which the flies deposit in the frontal sinus, during the earliest youth of the animals. A fact so important as this, certainly deserves to be positively ascertained; we have, therefore, stated it for the consideration of our readers.

The *flux* is a diarrhœa, or looseness, that attacks sheep which suddenly come to full feed, after having been stinted; though it is sometimes occasioned by their eating the plant known by the names of may-weed, mathen, or fœtid chamomile, (*anthemis cotula* of Linnæus). In general, the flux is not attended with any dangerous consequences, and usually disappears in the course of a few days, in dry weather. Should it, however, continue longer than a week, it will be proper to give them some well-dried, sweet hay, and a decoction of clover flowers, with the addition of a little barley meal; allowing them neither any salt, nor to feed on any saline plants near the coast. But it is evidently the farmer's interest to give these useful animals a regular supply of food,

*Agricultural Report of the county of Perth, 8vo. ed.

† Hogg's Shepherd's Guide, page 118. 1807.

as the weakness occasioned by the flux must necessarily reduce their condition.

The fly.—This disorder is chiefly confined to sheep that are continually exposed in hot seasons, particularly in inclosed woody districts. The insects from which the disease derives its name, live among the wool, where they materially prevent sheep from thriving, from the severity with which they bite. Hence various remedies have been suggested, most of which, however are in some degree injurious to the wool. Flour of sulphur, mixed up with butter, lard, or other unctuous substances, and rubbed in with the hand, or four onnces of sulphur mixed with a pint of train oil, and four ounces of oil of turpentine, have been found sufficient to effect a cure, and least hurtful to the quality of the wool: the remedy, suggested by Sir Joseph Banks for the *scab*, in sheep, hereafter described, may also be applied in the present case. When, however, maggots are formed, they should be carefully scraped from the wound, to which turpentine and brandy, mixed together, may be applied. Mr. Marshall * directs such maggots to be picked out with a knife, or otherwise removed. without breaking the coat, when a quantity of white lead is to be scraped among the wool, which being agitated, the powder is carried evenly down to the sore. But due attention must be given, that too much ceruse be not applied, as it will discolor the wool; while a small quantity prevents any further injury from the maggots remaining among it, as it drives them away from the wound, the healing of which it promotes at the same time. Mr. Priest, an intelligent chemist of Norwich, has prepared a cheap liquid, that not only cures where the fly has already struck, but also prevents its future attacks. It has been very extensively and successfully used by the Norfolk sheep-farmers.

The *foot-halt*, as its name announces, is peculiar to the feet of sheep. It is occasioned by an insect resembling a worm, two, three, and sometimes four inches long. It is indicated by lameness, which often increases to such a degree as to prevent the animal from grazing. From pain and want of appetite, the sheep languishes, till at length it falls a victim to the disorder, unless the worm be opportunely extracted.

As soon, therefore, as a sheep is observed to limp, the lame foot ought to be examined between the close of the claws, where the skin is found perforated, through which the worm has worked its passage upwards, between the external membranes and the bone. In order to extract the insect, it will be sufficient to move the claws in contrary directions, backwards and forwards, till the worm gradually makes its way to the surface. This simple expedient is far preferable to the operation of drawing out the insect, as in the last case there is always danger of its breaking off, and rotting in the leg of the sheep, which will thus be materially injured. As the foot-halt occurs more frequently in wet than in dry seasons, and generally in the spring and fall, but rarely in summer and winter, it may be prevented, in most cases, by pasturing sheep in dry and healthy grounds, rather than in low meadows or marshy soils.

The *foot-rot* is another disease peculiar to the feet of sheep, and if it be not quickly eradicated, generally proves contagious. It arises, in general, from sheep-feeding on long, rank grass, in wet seasons; but inattention to cleanliness will also produce the foot-rot as well as the foot-halt.

This disease is known by lameness, which increases as the foot-rot becomes more inveterate, by the oozing of a disagreeably fœtid matter from between the claws, and by the appearance of proud flesh in the more advanced state of the malady; at length, if it be not timely discovered, the foot becomes so completely mortified by the cancerous humor corroding every part of it, as to become incurable, in which case the skin is the only valuable part of the animal. It is remarkable throughout the progress of this disease, that sheep retain their appetite, and apparently feed as well as when in perfect health, though they very soon fall away, and continue declining till they have lost all their fat. Their appetite, however, remains till the very last stage; and instances have occurred in which they have been so eager as even to crawl on their knees for food.

Various remedies have been tried and recommended for the cure of this contagious disorder, of which the following appear most deserving of notice. As soon as the disease is discovered, the sheep should be separated from the rest of the flock, and put into a dry pasture, or confined in a barn, shed, or yard with a chalk bottom, and the part affected pared and cleansed, so as not to touch the quick, and at the same time to remove the gravel, if any should be there contained; after which either of the remedies subjoined may be applied:

One ounce of blue vitriol and six of water or vinegar.

Or,

Mix four ounces of the best honey, two ounces of pulverized burnt alum, and half a pound of powdered Armenian bole, in such a quantity of train or other fish oil as will make the various ingredients of the consistence of salve. The honey should be first dissolved gradually, and the bole carefully stirred in, and then the alum and oil are to be added.

Or,

Reduce three ounces of verdigris, four ounces of alum, a similar quantity of vitrol, one ounce and a half of white mercury, and one ounce of white copperas, respectively into fine powder, gradually dissolve the whole into one quart of white-wine vinegar.

It may be proper to observe, that the former of the last two remedies were invented by Mr. George Culley; and the latter by the late eminent Mr. Bakewell. In Mr. Young's opinion,* the salve is more efficacious than the liquid, having in one or two cases effected a cure where the latter had failed; but Mr. Y. states, that he uniformly employs Mr. Bakewell's remedy before the animals are anointed with Mr. Culley's salve. The following have been tried with success:

Two ounces of roche-alum, a similar quantity of blue vitriol, one ounce verdigris, and a quarter of an ounce of animated quicksilver, dissolved in a quart of good distilled vinegar; to be dropped on the diseased part, care being taken to keep the feet dry, and clean from all dirt or filth.

* Rural Economy of the Midland Counties.

*Annals of Agriculture, vol. xxi.

Or,

When a sheep is first observed to be affected, let it be brought in, and the sore foot well washed with soap and urine; then well bathed with turpentine, and afterwards rubbed all over with tar, and bound up with flannel; and if it be then turned into a clean dry pasture, the cure is certain. *

In some observations on the nature and cure of this malady, communicated to the Board of Agriculture by R. Worthington, esq., of Southend, the fact of its being contagious is clearly established; and the following method of treatment is stated to be that which has proved most successful. It consists, first, in perfectly cleansing the feet with soap and water; then, in scraping with a knife, and occasionally cutting off the foul and putrid portion of the foot, whether of the interior softer parts, or of the hoof. After this, the bloody surfaces are to be scoured with a mixture consisting of equal parts of muriate of antimony, tincture of benzoin, and tincture of myrrh; and a little muriate of antimony alone is directed to be applied with a hair pencil to the more ragged and diseased parts. To the practice of muffling the feet, in order to keep them dry, Mr. W. objects most decidedly; because, if the land be wet when the sheep are turned out, the feet will suffer more from absorbed damp, than if they were not covered at all. He considers it preferable to give them food and lodging under an appropriate shed, or in some convenient out-house; and, at all events directs that they should be kept on some dry treading, for an hour or two, after every dressing. The practice here described, Mr. W. asserts, will always put a stop to the progress of the foot-rot. † *Lime* has also been found an efficacious remedy; and may be advantageously applied to whole flocks by spreading it on their pasture. In corroboration of this fact is one mentioned in the Agricultural Survey of Devonshire, ‡ of one lot of sheep having been divided between two persons, one of whom turned his proportion into a field recently covered with a full dressing of caustic lime, where they remained perfectly sound; while the other portion were much infected with the foot-rot.

The following mode of treating this troublesome malady was communicated to the Society of Arts by Mr. Richard Parkinson of Walworth, who was honored with their silver medal for it. In sheep thus affected, he directs the hoofs to be pared, leaving no hollow to hold dirt; if matter be formed, it must be carefully discharged, after which the feet must be washed clean from dirt with some stale urine, and wiped with a sponge. The sheep are next to be put into a house or shed the floor of which has been previously spread, about two inches thick, with quick-lime reduced to powder by a small quantity of water. The fresher the lime is, the better. Upon this, the sheep are to stand for six or seven hours, and the cure will be effected. §

Gall, or scower.—This disease prevails chiefly during winter, and is supposed to be produced by severe frosts. An immediate change to dry food is the best remedy that can be resorted to; and it appears from the practice of Mr. Ellman, that if some hay be given to sheep on those mornings when hoar frosts are upon the ground, it prevents them from being attacked by the gall.

Hoven or blown. See the first chapter of this book. [p. 619 Farmers' Register.]

The *hunger-rot*, is generally occasioned by poor living, especially from a scanty supply of winter fodder. It may easily be known by the leanness of the sheep. An immediate change of keep is the proper cure.

Pelt-rot.—In this disorder the wool or hair falls off spontaneously from the sheep. Scanty keep, exposure to much wet, or sometimes a sudden change from poor to full feeding, will variously produce the pelt-rot, which is likewise occasioned by the scab. In the last case, the removal of that disease will of course effect a cure; but in the former instances, as soon as a sheep is discovered to be affected, (if not too far gone,) it should be separated from the flock, and driven into a detached yard, where the diseased part should be cleansed, and the animal anointed with a mixture of turpentine, lard or other grease, and tar, in such proportions as to form a salve, (a piece of cloth being sewed on the animal to keep it from the cold;) and where they should be supplied with the best food, an attentive regard to the regular distribution of which, especially in winter, would effectually prevent this malady.

Red-water.—This malady is sometimes called the *resp*, and is believed to originate from sheep feeding too freely on turnips, clover, or other rich and succulent vegetables. Frequent driving about, and the use of common salt, are said to be successful remedies in the red-water, which, it is asserted, may be *prevented* by giving the animals dry provender, in the course of the night, after they have been feeding on the vegetables above mentioned. The use of parsley in this malady is likewise said to be beneficial.

"This disease commonly makes its appearance about the beginning or end of winter, and first affects about the breast and belly, although at times it spreads itself over other parts of the body. It consists in an inflammation of the skin, that raises it into blisters, which contain a thin, reddish, and watery fluid. These continue for a short time, break, and discharge their matter, and are followed by a blackish scab.

"When the sheep are exposed to cold or wetness, the skin being fretted, makes the blisters rise; or they often arise from cold affecting the animal internally; thus producing a slight fever, which throws out these vesicles on the body, similar to the scabby eruptions which appear about the face, and more particularly about the mouth, of persons affected with cold. The blood in this disease is but little affected, although a little of it oozes into the vesicles on the skin and communicates to them that reddish tinge, which gives origin to the name.

"Red-water is a disease that but rarely appears in this country, and is seldom fatal. In cases where the disease is violent, a little blood should be taken. The sheep should be placed in a fold by itself, the blisters slit up, and a little infusion of tobacco put into them, and the following medi-

* Hogg's Shepherd's Guide, p. 170.

† Communication to the Board of Agriculture, vol. vii. part i.

‡ Vancouver's Survey, p. 341.

§ Transactions of the Society of Arts, &c. vol. xxvi. pp. 126, 127.

cine may be given for three or four mornings successively:

"Take of sulphur two ounces, honey, treacle, or sirop, three ounces; mix them and divide them into six doses, of which one may be given every morning, in half a mutchkin of water.

If this is found unsuccessful, half an ounce of nitre, mixed with the foregoing receipt, will be attenedd with good effects; after which a dose of salts may be given, and the body washed with lime-water upon the parts affected." * Mr. Benjamin Holditch directs a drachm and a half of pearl-ash to be dissolved in a pint of water, and given to each sheep every second morning while the disease lasts.

The *rickets* occur chiefly in the county of Huntingdon, where they are supposed to have been introduced from Holland. Few diseases are more fatal than the rickets, the causes of which have never been precisely ascertained, so that no remedy applied for its removal has hitherto been attended with success.

The symptons of indicating the existence of this malady, are first a species of giddiness, which renders the sheep uncommonly wild and fierce; starting up suddenly, and running, on the approach of any person, to a considerable distance, as if it were chased by dogs. In the second stage, a violent inflammatory itching in the skin takes place; the sheep rubs itself vehemently against trees, hedges, &c., so as to pluck off the wool, and even to larcerate the flesh; no cutaneous eruption ensues, nor does any discharge of matter follow, and every thing indicates a most ardent fever. In the last period of the rickets, the progress towards dissolution is very rapid, and the sheep, after reeling about, lying down, and occasionally taking a little food, at length expires.

This disorder is chiefly prevalent in the spring, and is hereditary; so that, after remaining concealed for one or two generations, it re-appears with increased violence. The rickets also appears *suddenly*, in consequence of which circumstances no precaution of the most judicious grazier can detect the malady; hence there is no alternative, but to cease breeding from such stock. We trust the attention of graziers and breeders will be more particularly directed to this formidable malady.

The *rot*.—Few disorders have been more fatal to sheep, or have more freqently exercised the attention of graziers and breeders than the rot; for the origin of which various causes have been assigned. Thus it has it has been attributed to fluke-worms, that breed in the livers of sheep, whither they are conjectured to be conveyed through the nostrils while the animals are grazing; † but these worms are evidently rather the *effect* than the cause of rot. The late Dr. Darwin suspected it to proceed from the inactivity of the absorbent vessels of the livers of sheep: so that their bile becomes too thin, particularly in wet or moist seasons. Dr Harrison, in an interesting tract on the rot, is of opinion that it originates from *paludal effluvia*, or those unwholsome exhalations that arise from marshes; but to this suggestion salt mashes form a striking exception. And it is a fact, that in the county of Lincoln, in rotting seasons, the sheep fed on salt marshes, which are overflowed by the spring tides, sell at very high prices, from the confidence that they are safe. From an attentive consideration of every circumstance, it is evident, that superabundant moisture, either of food, (for experience has proved that even one half hour's feeding on moist or marshy lands, in hot weather, will produce it,) the atmosphere, or situation, is the real cause of this dropsical malady; though it is certain, that the dry limed land in Derbyshire will produce it as well as meadows that retain water and stagnant marshes; so, in driving sheep to any dis ance, if they be suffered to lie only one night on a wet spot of ground, whether in an elevated situation or not, they are very liable to the rot.

The symptoms indicative of this fatal disease are thus accurately stated by Dr. Harrison, from whose very able "Inquiry into the rot in sheep and other animals," we have selected them. "When, in warm, sultry, and rainy weather, sheep that are grazing on low and moist lands feed rapidly, and some of them die suddenly, there is reason to fear that they have contracted the rot. This suspicion will be further increased, if a few weeks afterwards the sheep begin to shrink, and become flaccid in their loins. By pressure about the hips at this time a crackling is sometimes perceptible. Now, or soon afterwads, the countenance looks pale, and, upon parting the fleece, the skin is found to have exchanged its vermillion tint for a pale red; and the wool is easily separated from the pelt. As the disorder advances, the skin becomes dappled with yellow or blacks spots. About this time the eyes lose their lustre, and become white and pearly, from the red vessels of the *tunica adnata* and eyelids being contracted, or entirely obliterated. To this succeed debility and emaciation, which increase continually till the sheep die; or else ascites, and perhaps general dropsy, supervene, before the fatal termination. These symptoms are rendered more severe by an obstinate purging, which comes on at an uncertain period of the disorder. In the progress of the complaint, sheep become what the graziers call chockered, i. e. affected with a swelling under the chin, which proceeds from a fluid contained in the cellular membrane under the throat.

"In five or six days after contracting the rot, the thin edge of the small lobe of the liver becomes of a transparent white, or bluish color, and this spreads along the upper and lower sides, according to the severity of the complaint. Sometimes it does not extend more than an inch from the margin. In severe cases, the whole peritoneum investing the liver is diseased; and then it commonly assumes an opaque color, interspersed with dark red lines or patches. The upper part of the liver is sometimes speckled like the body of a toad, to which it is said to bear striking resemblance; round the *ductus communis choledochus* and hepatic vessels, a jelly-like matter is deposited, which varies according to the severity of the attack, from a table-spoonful, or less, to five or six times that quantity. Upon boiling, the liver loses its firmness, and separates into small pieces in the water, or remains soft and flaccid.

Several graziers and butchers, with whom I have conversed at different times, having observed that sheep are much disposed to feed during

* Hogg's Shepherd's Guide, p. 183, &c.

† Letters and papers of the Bath and West of England Society, vol i.

the first three or four weeks after being tainted, omit no opportunity of producing it, to increase their profits. When the first stage is over, flukes begin to appear in the *pori biliarii*, the *ductus communis choledochus*, and in the gall-bladder. At first, the quantity of these creatures is small; but, as the disease advances, they increase, and before death are often very numerous. In the last part of the complaint, they are sometimes to be found in the stomach, as well as in the intestines and liver. This, like the visceral disorders of the human body, may terminate in resolution, effusion, suppuration, or scirrhus.

1st. "The complaint is said to terminate in resolution, when the inflammatory action goes off, without destroying the state and texture of the parts. However, I am strongly inclined to believe, that every considerable inflammation in the human body, and in other animals, although it ends in resolution, leaves behind it some remains, which may be discovered by an experienced anatomist. When the vessels are thrown into inflammatory action for a few days only, effusion commonly takes place, and the coats become thicker, and assume a buffy color. These changes in the sanguinary system often continue through life, and lay the foundation of many chronic and incurable disorders. Sheep that recover from the rot exhibit very different appearances after death, according to the severity of the attack; but the taint is seldom or never entirely removed. I was desired, within these few days, to look at the liver of an old ewe, that died fat, and contained fourteen pounds of suet in her body. The back part of the small lobe was dappled with whitish spots; the coats of the *ductus communis* and *pori biliarii* were considerably thickened, and more solid than usual. In color, they resembled the human *aorta* in old people, and were full of flukes; in other respects the liver appeared to be sound and natural. The butcher asserted, that the variegated appearance and alteration in the ducts, were occasioned by a slight taint of long standing, which had not been considerable enough to disorder the economy, or impair the health of the animal sufficiently to prevent its feeding.

2dly. "When sheep die suddenly in the first stage of the disorder, an effusion of serum, or of wheyish-colored fluid, may be commonly discovered in the cavity of the abdomen, and then the *peritoneum* surrounding the liver is generally covered with a membrane or coat of coagulable lymph. This form of the rot has been frequently confounded with the resp, or red-water, though it differs from the latter disorder in the color of the effused liquid, in being much less disposed to putrefaction, and in several other particulars.

3dly. "Abscesses of the liver exhibit another termination of this malady. They are seldom considerable enough to kill immediately; but, in consequence of the absorption of purulent matter from them, the sheep consequently waste away, and die hectical or dropsical. When the collections are small, sheep will recover sufficiently to bear lambs for three or four seasons, and afterwards become tolerable mutton.

4thly. "The most common termination is in scirrhi, or what the shepherds call knots in the liver; I have seen the whole substance of this important viscus so full of small, roundish lumps, or scirrhous bodies, that it was difficult to find any sound part in it. The first attack is unfortunately so very insidious, that the disorder is scarcely observable, before the animal begins to waste and lose flesh. In this advanced state it is said to labor under the rot, or *pourriture*, from overlooking the commencement of the disorder."

Equally various with the conjectures respecting the origin of this destructive disease, are the remedies which have been recommended. The late eminent botanist, Miller, advised *parsley* to be employed as a preventive, which is eaten with great avidity by sheep, (the delicacy of whose flesh it greatly improves,) as instances have occurred where sheep, fed on parsley, remained sound, while those in the neighborhood were affected with the rot: he, therefore, recommends sheep to be fed with that vegetable twice in the week, for two or three hours each time.

In places where the rot is usual, it will be advisable uniformly to fold sheep (where that practice is retained) before the dew falls, and to confine them in such folds till it evaporates, both in the spring and summer; feeding them with sweet hay, or other dry provender. In the 'Bath Papers' already referred to, it is remarked, that no ewe is ever subject to the rot while she has a lamb by her side; and it is there recommended, to place sheep that are affected with this distemper, so that they can get at the bark and young shoots of elder. Mr. Price (in the same practical work) advises every farmer to remove his sheep in wet and warm seasons, from such lands as are liable to occasion the rot; but, if this object cannot be obtained, he directs a spoonful of common salt, and a like quantity of flour, to be given to each sheep in a pint of water, once or twice in the course of the, week by way of preventive. And in case the disease be in an incipient state, he is of opinion, that the giving of such a dose for four or five mornings successively, will probably effect a cure; for the addition of the flour and water not only abates the pungency of the salt, but also disposes it to mix more gradually, and consequently more effectually, with the chyle. The late Dr. Darwin, however, conceived that salt would be more efficacious if it were combined with iron filings and flour, and made into a ball, to be given every morning successively for a week. Further, as a preventive, it has been reccommended by Mr. Varlo, an experienced agriculturist, to give each sheep a spoonful of common salt once a week, when a "*rotting season*" is apprehended; and, when the animals are accustomed to it, he directs some dry salt to be laid on flat stones, in various parts of the pasture, as they will then lick it up without any further trouble.

A very extraordinary operation for the prevention of this most destructive malady, is practised by the German sheep-farmers; and the happy effects of which having, it is said, been incontestibly proved, deserve the attentive consideration of every flock-master, though we feel compelled to doubt its efficacy. We refer to the *inoculation* of sheep for the rot, which produces in them the same effect as variolous inoculation does on the human frame. The inoculated animals contract the disorder, the symptoms of which are very mild, and the recovery from which is affirmed to be both speedy and certain. From the experiments which have been made, it has been proved,

that *inoculated flocks are protected from all contagion.** Rams, tainted with the rot, have coupled with inoculated ewes, which, together with the lambs that sprung from these embraces, have presented no symptom whatever of the rot. But this proceeds upon the principle that the rot is hereditary which is far from being an admitted fact. Mr. White, indeed asserts as much in his "Compendium of Cattle Medicine," but he afterwards qualifies the assertion by an opinion "that the disposition, or liability to the disease, is hereditary; and that disposition to the disorder is nothing more than constitutional debility." But there are many strong reasons to doubt the accuracy of that view of the subject, among which the fact, that if sheep bred from the same ram, be distributed partly upon dry pasture, and partly upon wet land, the latter will become infected, while the former will remain sound, appears to us conclusive; therefore, the disease is not constitutional; and if not, inoculation can be of no service.

The inoculation is performed by making an incision in the inner face of the thigh, from which the wool is stripped, about four fingers distant from the anus. The incision must penetrate the skin; but care should be taken not to wound any muscle, lest an effusion of blood should ensue. A pustule of an infected animal is next squeezed with the fingers; and, after taking away the virus thence issuing, on the point of a lancet, it is transferred to the wound of the individual which is intended to be inoculated.

Besides these preventive remedies, various medicines have been recommended to the attention of farmers and breeders; though we conceive, they can only be employed with probability of success in incipient cases. Of these remedies we select the following: 1. Put a handful of rue into a pailful of water in the evening, and on the following morning add such a quantity of salt as will make brine strong enough to float an egg. Half a pint of this infusion is to be given, as a dose, every other day, for a week. 2. Infuse soot in strong brine and stale urine, and give each animal six or seven spoonfuls for eight or ten successive days. 3. Ellis recommends a peck of malt, or more, to be mashed and brewed into 12 gallons of wort, in which a quantity of bloodwort, comfrey, pennyroyal, plaintain, sage, shepherd's purse, and wormwood, are to be boiled; the liquor to be worked with yeast, some common salt to be added, when it is to be put into a cask for use. Of this medicated beer seven or eight spoonfuls are to be given to each sheep, once in the course of a week during wet weather; but at longer intervals in dry seasons.

Among other remedies, we would here notice a patent which was granted to a Mr. Thomas Fleet, in October, 1794, for a medicine, which he affirms will not only prevent the rot in sheep, but also check the farther progress of the disorder in such as are already affected; *so as to render them capable of being fattened on the same herbage which produced the disease.* His restorative medicine consists of the following articles, the proportions of which, however, are *not stated* in the specification of his patent; viz., alkanet root, antimony, Armenian bole, bark, camphor, mercury, opium, salt, sulphur, turmeric, turpentine, and distilled water; which multifarious ingredients are simply directed *to be prepared according to chemical, and compounded according to medical art!* Not having had experience of the effects of this celebrated nostrum, we cannot say how far it answers the properties claimed for it by its inventor; but if the disease is to be cured, or prevented by medicine, a man, who includes the whole materia medica in his prescription, must, certainly, have a chance of success; so far, however, as our own experience goes, we would recommend sound pasture as the best *preventive*, and the butcher's knife as the only *certain cure.*

We shall conclude these remarks on the prevention and cure of this tremendous malady, with the following interesting observations selected from Dr. Harrison's valuable 'Inquiry,' already referred to:—

"It is confirmed by experience, that whenever any place is laid dry by judicious management, it ceases to occasion the rot. For my own part, I am acquainted with many sound parishes, which, during their open state, were so injurious to man, and to other creatures, that I cannot sufficiently impress upon my readers the importance of effectual drainage, for the preservation of health. When, from circumstances, the land cannot be laid dry, during the summer months, it requires to be occupied with great caution, since moist grounds are the most prejudicial and dangerous to animal life. I have had occasion to observe that miasmata are produced in some way or other by the sun's action upon moist ground, and, therefore, when it is well covered with grass, early in spring, we have less danger to apprehend, provided we maintain a deep herbage till the commencement of frosty weather.

"Mr. Young, of Claxby, is of opinion, that when land is well covered with grass it becomes less dangerous to cattle. In 1792, he divided a flock of sheep, and placed fifty upon some good aftermath, where, in other seasons, the rot had frequently prevailed. Only this part of his flock escaped the disorder, which he attributed to the meadow not having been grazed before it was well covered, and defended from the weather.

"Luxuriant pastures seldom rot, unless they be eaten bare in hot weather. Whilst the ground is well concealed, it is so completely defended and protected, that the sun exerts no deleterious effects upon it. In the fatal year, so often particularized, Mr. Elmhirst, of Bag Enderby, an experienced and zealous agriculturist, who occupied two hundred acres of land in the parish of Croft, near Wainfleet, sold all his heavy beasts, and many sheep, early in the summer. His pastures were thinly stocked with sheep only, during the rest of he year. The rot was extremely destructive in all the adjoining pastures, yet in his closes it never appeared. This exemption from the general calamity of his neighbors he attributed partly to his land being always well covered with grass, and partly to his grazing during that summer entirely with sheep. In wet weather, beasts and horses, by treading the ground, leave foot marks, where the water stagnates, and in consequence of it, as he believes, the rot is produced. In justice to the testimony of Mr. Elmhirst, it may be proper in me to add, that he has been an active and judicious cultivator of land, on a large scale, for a

*Lasteyrie's "Histoire de l'Introduction," &c. p 193.

great number of years; every observation of his is, therefore, entitled to particular attention.

"I have remarked, that sheep are most liable to rot immediately after losing their fleeces; and in the month of November, when the cold first begins. No rot can be contracted without warmth, or in spring, before the sun's influence is become considerable; but, when the disposition is once acquired, it can only be subdued by frost, or a long succession of cold weather. Gabriel Plats assures us, with confidence, derived from the experience of seventy-four years, that the only infectious months that beget the great rot are May and June, when excessive moistures befall those months. In a few instances, it has appeared in April, when showery weather and great heats have prevailed. In ordinary years, meadow may be irrigated till May, without any injury to the occupier. In doubtful cases, the generation of miasma will be effectually restrained, by continuing a copious and regular watering till the grass is well grown. The late Mr. Bakewell was of opinion, that after May-day he could communicate the rot at pleasure, by flooding, and afterwards stocking his closes, while they were drenched and saturated with moisture. In summer, rivers and brooks are often suddenly swollen by thunderstorms, so as to pass over their banks, and cover the adjacent low lands. In this state no injury is sustained during the inundation; but when the water returns to its former channel, copious exhalations are produced from the swamps and low lands, which are exceedingly dangerous to the human constitution, and to several other animals as well as sheep. I formerly mentioned, that during the summer, Mr. Harrison could give the rot to his sheep in a few minutes, by grazing them upon the moist soft land, from which the water of the Barlings had just retired. While there is any current, the sheep will never become tainted, although they often wade in search of their food.

"When miasmata are once formed, they preserve their noxious powers and destructive influence unimpaired, till the cold weather puts an end to their force and activity. In mild seasons, epidemic diseases have been known to afflict the human constitution, during the greatest part of winter; and the pastures which have once become unsound, are only to be recovered by the setting in of frost, or a succession of cold days and nights.

"The autumn and winter of 1799 and 1800 were remarkably mild and warm At Candlemas time, sheep that were pasturing on the fen and commons at Walshinbrough, near Lincoln, took the rot, and died in the following autumn. No farmer in that parish recollected to have suffered, at any other time, from the rot in spring. Mr. Thompson, of Horncastle, informs me, that many years since, his brother occupied a low, wet close in the parish of Hatton, and lost all his sheep, before winter, of the rot. From that time the land remained unemployed till about Candlemas. It was then filled with strong, healthy sheep; but they were all rotten, and many of them dead before the following May-day. He recollects, that there was very little frost during that winter, and, consequently, the effluvia were kept alive by the abundance of the herbage. Plats gives it for an infallible symptom, that when bees fail, and their hives feel light, a great rot of sheep is to be expected; which gives a very seasonable warning to bleed the sheep under the eye, or in the mouth, as oft as they see occasion, in the end of summer, or in autumn; or to accustom those which are suspected, to lick salt in troughs, or to take some brine with dry food, as they may be easily trained to it by gentle degrees; or to force down a dose of salt, as is directed.

"Where necessity requires the pasturage of moist grounds in summer or autumn, the shepherd ought carefully to remove his flock into a dry situation before the evening, and provide them with corn and good hay, or green food."

Upon the whole, from whatever cause the rot may proceed, it is evident, that the chief thing on which the farmer can depend is, that of changing the situation of the sheep to a dry spot, or of keeping them in warm and well-sheltered yards, and regularly giving them sweet, dry keep. If medicine be necessary, let a ball be given daily, for a fortnight, composed of five grains of muriated quicksilver, and one grain of opium, in camphor or turpentine; increasing the proportions, if the operation be deficient, and with slight intervals, if the balls operate too powerfully. When the sheep begin to recover, salt should be constantly given them with dry food; and, when they are turned out, they should be driven to a dry, salubrious, and elevated sheep-walk, or into a salt-marsh, if there be one in the vicinity.

The *Rubbers*, or *Rubs*, is a species of itch, which renders sheep extremely restless, and in consequence of which they rub themselves to death, being completely, but gradually, exhausted, from not being able to feed. Their skins are perfectly clean; and, when dead, their flesh becomes of a greenish hue, without possessing any bad taste. Those animals which are fed on fine, rich soils, are more liable to the rubbers than those which are pastured on poor lands; and the disease usually terminates in the course of three or four months. No effectual remedy has been hitherto discovered; though it is probable that relief might be obtained by washing the diseased sheep with strong soap-suds or ley, or by recurring to the remedies employed for the scab.

Scab.—This disease is likewise known by the name of *shab*, or *ray*, and is attended with an intense itching, and cutaneous, scabby eruptions, occasioned by the impure state of the blood. It prevails chiefly in wet situations, and during rainy seasons; and as the scab is said to be infectious, the diseased animals ought, in every case, to be separated from the rest of the flock.

The scabbed sheep should next be washed with a stong decoction of tobacco in brine, (in the proportion of one pound to two gallons,) to which a little oil of turpentine has been added; or, in inveterate cases, with a lather of black-soap, lime-water, or sublimate-water, and oil of turpentine; sulphur and bay-salt, or Glauber's salt, being administered internally. The following preparation has also been found effectual:—

Mix one pound of tobacco, one ounce of white arsenic, one pint of oil of turpentine, and six quarts of beef brine, with a small quantity of tar, and boil the whole till the ingredients become incorporated so as to form a liniment.

In applying which, every scab must be *broken*; and the sheep be well rubbed, that the liquid may penetrate every part. Another efficacious remedy

was communicated by Sir Joseph Banks to the "Society for the Encouragement of Arts, Manufactures, and Commerce," in 1789, from whose 'Transactions,' for that year, we have selected it:—

Let one pound of pure quicksilver, Venice turpentine, and common oil, of each half a pound, and four pounds of hog's-lard, be triturated in a mortar till the quicksilver is thoroughly incorporated with the various ingredients.

In applying this ointment, the head of the sheep must be first rubbed; after which, a furrow is to be drawn with the finger, from the region between the ears, along the back to the point of the tail, so as to divide the wool, till the skin be exposed to the touch. Then the finger being dipped into the unguent, must be drawn along the skin; and similar furrows should be made down the shoulders and thighs, as far as the wool extends; and if the sheep be much infected, two other lines, or furrows, ought to be drawn parallel to that on the back; and one should also be traced downwards on each side, between the fore and hind legs. After this application, it is stated, that the sheep may be turned out among the flock without fear of communicating infection, as the blotches will in a few days dry up, the intolerable itching will subside, and the animals will be perfectly cured without any injurious effects resulting from the use of such unction. But this external remedy should, in the opinion of Sir Joseph Banks, be not delayed longer than Michaelmas. The sulphur and turpentine ointment used for the fly will also frequently cure the scab, but the scabs must be scraped off before its application.

But, says Mr. Hogg, "the most effectual cure is that which can now be got in any apothecary's shop, known by the name of *sheep ointment*. It is a strong mercurial composition; and the most safe way is, for the apothecary to put it up in small balls, each of which he may deem sufficient, and safe to be rubbed upon a sheep at once; for, as different hands may make it of different strength, the most experienced applier can hardly be a competent judge how much is sufficient for each animal, without some such precaution. Let the shepherd, then, take one of these balls at a time, and mix it with three gills, or a mutchkin of train-oil, and if the animal be thoroughly infected, put the whole of this upon it, as close to the skin as possible; but if it is only scabbed or itching on some parts of its body, perhaps each of these mixtures may serve two. If the infected parts are mostly on the back, or upper parts of its body, the shepherd must make a shed, or opening of the wool, exactly on the very ridge of the back, from the crown to the tail; let him shed it clean to the skin, and keep it open with both hands, while another pours in the ointment from a common tea-pot. He must not keep the wool too close down with his hands, else it will cause the ointment to drip upon it. In this case, a few sheds, or openings, will do; but if it is scabbed about the belly and throat, it must be shed very thick, and the ointment rubbed on the skin with the fingers, as it cannot then spread in the skin by running. Let it always be done in dry weather; and it is a safe and certain remedy, though, perhaps, the scab may again appear on the offspring of this flock. Sheep, however, are sometimes seriously injured by a too long-continued application of mercurial dressings." *

The *Tick* is a small, brownish, and flat insect, infesting sheep, and which, if not speedily destroyed, materially injures both the flesh and wool into which it insinuates itself. When the vermin have settled, scabs are formed on the surface, whence a small quantity of matter issues; as the insects increase in growth, the scab becomes proportionably larger, and at its full size nearly resembles a middling-sized horse-bean. In order to remove these noxious vermin, (which spread very rapidly,) it has been recommended to separate the wool, and to wash the diseased spots two or three times, or oftener, if necessary, with either of the following liquid preparations:—

One ounce of cream of tartar, and a quarter of a pound of bay-salt (both finely-powdered and sifted,) and one ounce of corrosive sublimate, mixed together in two quarts of soft-water.

Or,

Four pounds of soft-soap, and two pounds of arsenic may be steeped in thirty gallons of water, and the animals be immersed in the infusion, their heads being carefully kept above water, and the sheep being sheltered from rain for one or two days. The wool must be closely pressed, and liquor that runs off should be caught in a tub or other vessel, for future use.

Of the latter application it is sufficient to state, that it has been approved of and used by many eminent agriculturists; the proportion above specified is sufficient to bathe forty lambs. The preparation by Mr. Priest, of Norwich, already mentioned, may also be beneficially employed in this disease.

Affections of the Udders of Ewes.—After the lambs are yeaned, the lacteal ducts of ewes' udders are liable to various obstructions, in consequence of hard tumors being formed, which are accompanied with inflammation; and which, if not shortly relieved, will terminate in a mortification in twenty-four hours. As soon as such tumors are discovered, the wool must be shorn closely off, and the part affected be frequently rubbed with camphorated spirit of wine. Should suppuration ensue, the parts must be opened with a sharp knife, or razor, and the morbid matter expressed, when a little fresh butter, or any common healing-salve, may be applied to the wound. Ewes, when thus affected, ought to be kept separate from the flock; and, though one teat may probably be lost, yet she may be allowed to suckle her lamb; but when both teats are affected, there is no alternative but to fatten her off for sale, and to bring up the lamb by hand.

White Scour.—This disorder is a peculiarly violent and uncommon looseness, occasioned by sheep feeding on putrescent vegetables, especially the shells of turnips, when suffered to lie on the ground after the flesh or pulp has been scooped out. The diseased sheep must be separated from the flock, and three large spoonfuls of the following mixture be given to them, every second or third day, as the nature of the case may require:—

Mix half a pound of finely-powdered and sifted dry bay-salt with one pint of old verjuice, and then add half a pint of common gin.

* Shepherd's Guide, p. 96.

As poverty of keep is the primary cause of this malady, the animals must be allowed the best and most wholesome dry food, and should be carefully kept from wet.

Wounds.—Besides the various casualties above specified, sheep are liable to receive injuries from being wounded by thorns, &c., or worried, torn, or bitten by mischievous dogs, or such as are not thoroughly broken in. Although such accidents may be in general prevented by due care and attention, yet in cases of common green wounds it may be necessary to apply some healing or emollient balsam or salve, like the following:—

Let one ounce of myrrh, a similar quantity of Socotrine aloes, and four ounces of purified turpentine, be mixed with a quart of good brandy. The vessel should be corked up, and exposed for one or two weeks to a moderate heat, after which it may be strained off, and preserved for future use in a closely-stopped bottle.

Lastly, the shepherd ought frequently to examine his flock, and see that their tails and buttocks be kept perfectly clean, otherwise they will become *tagged*, or belted; *i. e.*, the skin will become excoriated and sore from the dung that adheres to those parts, especially when the animals are affected with the flux, or white scour. Where this is the case, the sheep must be taken into a dry, separate yard, and well washed with soapsuds, the wool around the sores being previously removed; after which the wounded parts may be strewed with finely-pulverized white lead, or chalk, and this may be succeeded by rubbing them with a mixture of brandy and tar; but cleanliness alone will be quite sufficient to effect a cure.

On the diseases of lambs.

It sometimes happens that lambs, when yeaned, are apparently lifeless, in which case it will be proper to blow into the mouth and nostrils; a simple expedient, which has been the means of restoring multitudes of those useful animals.

The *Black-water* is one of the most fatal maladies to which lambs are subject; the cause is not precisely ascertained; but the disease carries them off very suddenly, and occurs chiefly in the autumnal quarter. The best preventive hitherto known is, to keep them on very dry pastures.

The *blood*, or *red-water*, likewise often proves a mortal distemper to lambs. Its symptoms are lameness and a slight swelling of the joints, accompanied with a violent inflammation that spreads over the whole animal; and which, if disregarded, terminates its existence in the course of twenty-four hours. This disorder is produced by too great a quantity of food remaining in the stomach, in a crude and undigested state. As soon, therefore, as the disease appears, the lambs must be taken home from grass, be bled, and an emollient clyster administered. An ounce or two of castor oil, or as many grains of emetic tartar, should next be given, and the bleeding repeated, if no favorable symptoms appear, the treatment above specified being continued for four, five, or six days, as the case may require; and, during that term, the lamb should be fed with milk.

The *skit* is a kind of scour, or diarrhœa, and is sometimes divided into *green* and *white*, according to the appearance of the dung. Give a decoction of hartshorn-shavings and finely scraped chalk, in which a few grains of opium have been dissolved, and keep them on dry, wholesome food, in a well sheltered yard.

On the diseases incident to swine.

In the management of swine, various hints have already been given for the regular supplying them with food, and a due regard to cleanliness; these attentions cannot be too forcibly impressed, as on account of the unruly habits of those animals, they are the worst patients with which a farmer can be tormented.

Gargut, or *Garget.*—This is an inflammatory affection of the udder, or bag, being distended with coagulated milk, whence the lacteal ducts are obstructed. It is chiefly occasioned by not *sucking down* in proper time; though too rich keep, before the time of farrowing, will also produce this malady. In slight cases, the udders may be bathed with camphorated spirit of wine; but as young pigs will never suck their dams when the milk becomes vitiated, there is no alternative but gently to express the corrupted milk, if it can be effected; otherwise it will be best to kill the sow, which must necessarily perish from the inattention above noticed. *Garget of the maw* is merely a distended state of the stomach and intestines, from over-eating, and retained dung. Give one or two drachms of jalap; and repeat if necessary, administering at the same time a clyster of warm water and common salt.

Fever, or *rising of the lights*, as it is likewise called, appears to originate from over-feeding; it may be removed by administering a mixture of sulphur and oil.

Diseases of the lungs.—These are generally accompanied with a dry, husky cough, and wasting of the flesh, occasioned by too great exposure to cold and wet. The best remedy is a warm, dry sty, with a regular supply of food that is calculated to keep them cool, and allay the irritation attendant on their cough.

The *mange*, like the scab in sheep, is a cutaneous eruption, occasioned by inattention to cleanliness in hog-sties. It is easily known by the violent rubbing of the swine against trees, or any hard substance, with such violence as to tear away the head of the pustule, and to produce a disagreeable scab. When this disease appears, the animal affected must be be separated from the rest of the herd, washed thoroughly with a strong soap ley, and anointed with the following unguent, recommended by Dr. Norford*.

Incorporate one ounce of fine flour of sulphur, two drachms of fresh-pulverized white hellebore, three ounces of hog's-lard, and half an ounce of the water of kali, (as prepared in the shops,) so as to form an ointment.

This is to be rubbed in at one time; and is said to be sufficient for a breast of six or seven stone; if properly applied, Dr. N. states that no repetition will be necessary, if the hog be kept *perfectly clean* after the cure is performed. In case there is slight cough, he directs from half an ounce to one ounce and a half of crude antimony, according to the size of each animal, to be finely pulverized and mixed with his daily food, for ten days or a fortnight, when the swine will be perfectly restored. We should, however, doubt the propriety of giving this medicine. If, from long

* Annals of Agric. vol. XV.

neglect, the neck, ears, (especially in the large, lop-eared hogs,) or other parts become ulcerated, they should be annointed every third or fourth day with a little tar ointment, prepared by mixing equal parts of mutton suet and tar over a gentle fire, and straining such mixture while hot.

The *measles* exist chiefly in the throat, which is internally filled with small pustules, or tumors, that sometimes appear on the outward surface of the neck; and also affect the grain of the meat when killed. It is a very common disease, and is known by the languor and decline in flesh of the animal affected; and may be removed by giving small quantities of levigated crude antimony in his food.

The *murrain*, or *leprosy*, in swine, is indicated by shortness and heat of breath, heads hanging down, staggering, and a secretion of viscid matter from the eyes. The cause arises chiefly from hot seasons, in consequence of which the blood becomes inflamed. Remedy:

Boil a handful of nettles in a gallon of small beer, then add half a pound of flour of sulphur, a quarter of a pound of pulverized aniseeds, three ounces of liquorice, and a quarter of a pound of elecampane.

Give this liquid in milk, at six doses; and keep the diseased animals on wholesome food. But the best preventive is to keep swine clean and cool in summer, and to allow no carrion, or filth whatever, to remain near their sties.

GRAPE CULTURE AND PROFITS IN NORTH CAROLINA—RUTA-BAGA.

To the Editor of the Farmers' Register.

Brinkleyville, Halifax county N. C.
January 4. 1838.

Dear Sir—Although not having the pleasure of personal acquaintance with you, yet as the warm friend and efficient promoter of the art of arts—the great business of agriculture, and its kindred employments—you have endeared yourself to me, and seem as a familiar friend. In distributing vines and multicaulis plants, I have occasionally met with your patrons, and read your pages with much interest. I would have patronized you myself, but did not like to discontinue the 'American Farmer' and its successors, and do not yet feel able to patronize your's also. Through the suggestion of a few of your patrons as well as my own desire to do something for agriculture in your columns, I have, from time to time, resolved to offer you pieces for publication; but my multifarious employment, and press of business, have hitherto prevented. I have wished to communicate about native grape vines in answer to some of your correspondents. I have been cultivating a native of this county, called the "Halifax," that I believe is equal to any in the United States—in every respect excellent, and not subject to any casualities common to vine culture; such as rotting and mildew. I have about four acres in successful vine culture. The scuppernong, also, I should like to recommend in your columns. I lately visited the scuppernong vineyard of the late Capt. Burlingham near Louisburgh in this state, mentioned, you know, repeatedly in the 'American Farmer'. And I cannot forbear briefly naming to you, some particulars of my observations; there are just fourteen vines, the branches of which cover with a complete canopy about half an acre, and which yield to the present proprietor, Mr. John Broddie, on an average, 20 barrels of wine a year; that is considerably more than a barrel to a vine annually. I measured from the stock of one vine the extent of the canopy outward, which was 60 feet; indicating that looking forward to 15 or 20 years, 120 feet is near enough to plant scuppernong vines. With doubly refined sugar (and no spirits) I make scuppernong wine that brings me 30 dollars a barrel, ready market. I calculate that by prosecuting a system of managing vines, a hint of which originally appeared in the 'Farmers' Register,' I can make 3000 gallons of wine, either the scuppernong, or my Halifax, per acre. The hint was this—a gentleman wrote that he laid by corn with a thickness of wet leaves from the woods. I tried it, (the corn) with entire success, and also have vines, with every promise of entire success. After the 3d year, or when no longer profitable to cultivate the ground, I threw a thickness of pine straw, green pine boughs, and the like, which prevents all trouble of working the ground, and acts eventually as the best of manures for the vines.

My Halifax makes either a white or red wine pronounced by some equal to Maderia. If you wish, I will take opportunity to send you samples of the above-named vines.

I have wished to communicate to you on the culture of the ruta baga.

Notwithstanding that I was warned by a friend, that the culture of this plant had been attempted in this region without success, about 8 years since I undertook its cultivation, and have not yet failed to have good annual crops; but I attend to it personally, and do not commit the business to the care of servants. Some around me are now imitating my example. Through my recommendation, the culture has been pursued successfully by some in Granville county; and among a family of the Mr. Watkins's, Virginia. Mr. William J. Watkins is, or was one of your patrons, and got last winter a hundred dollars worth of the morus multicaulis of me, to enter upon the silk culture. Mr. Massenburgh, near Louisburgh in this state, a patron of your's informed me lately, he had tried the ruta baga culture without adequate success. But on inquiry, I believe the reason was, he drew up dirt to the plant, instead of rather drawing therefrom. One or two points to success I would here name. The planting in our region should be on, or before the middle of July—and in drills, about 3 feet, and about a foot eventual distance in the drill. I have hereby made at the rate of more than 600 bushels to the acre; light land is preferable, but manured well in the drill, any land will, with proper management, produce good crops.

Not having time to prepare you at this time any regular, or properly written article, I enclose, or send you two newspapers in which are pieces of mine, with which, and this hasty scrawl, you can make such use as you think best. The Raleigh paper contains a just compliment of mine to you—not designed to meet your eye when sent for publication; but Mr. Gales sending me a copy of his paper, or the number transmitted, I concluded to send it to you, with a request that you would, if thinking of it, return it to me by mail.

SIDNEY WELLER.

From the Raleigh Register.

ON THE CULTURE OF GRAPE VINES.

Messrs. Editors:—An apology is due you from me for the long delay in offering you communications, according to promise, for your valuable periodical. Want of time, hitherto, is my plea. For since my visit to your city, last spring, unremitted labor and attention to my complicated business of vineyards, nurseries, and plantation, has left me no leisure for writing in the day time; and the nights have been too short for that purpose. But since they have now sufficiently lengthened, I may trouble you, with a series of short essays on the vine and mulberry culture, and kindred subjects. And however such subjects may fail to interest, when discussed by me, yet in the view of all truly enlightened patriots and statesmen, agriculture, including its various branches, confessedly lies at the foundation of human society and welfare; and, therefore agricultural improvement is of the utmost importance to all. And that this branch of the arts is as capable as others of great and continued improvements, by the accumulated lights of science thereon, is manifest by the fact of various kinds of agricultural products being *doubled*, *trebled*, *quadrupled*, and more, in those countries and districts where attention and emulation have been excited by agricultural societies, legislative premiums, and the like; and where, we may emphatically add, the *press* has diffused light and intelligence among the people on the subject of this first of arts and sciences. We might point you for example to Great Britain and other parts of Europe, as well as to different districts of our own free, enterprising, and beloved country.

Look at the state of Massachusetts, where an enlightened legislature, by giving some *thousands* in the way of agricultural premiums, has increased the resources of the state, *millions*. What but improvements in agriculture, by societies, periodicals, and the like, connected with the judicious application of the school fund to impart the blessings of education among all classes of the people, has conferred the title of *empire state* on New York? And shall not North Carolina awake to the importance of this subject, as well as to that of rail roads? For, we may say, what are the advantages of rail roads, if, by wretched and erroneous management, lands continue to become sterile and emigrations to the far west, increase? At length, nothing may be produced to transport on the rail roads. Virginia, an adjoining and sister state, has awakened up to this subject, and that mainly, we may say, owing to the exertions of one individual, Mr. Ruffin, and one periodical, the '*Farmers' Register.*' And, if *single force* in one state can do so much in this all important matter, what might not the united force of North Carolina's enlightened sons do?

And to return from this digression, or general remarks on agriculture, to the particular branches first named, I would remark, from personal experience, as well as observation, that North Carolina is as well calculated by soil and climate as any part of America, not to say the world, for the vine and silk culture. In Europe, six or eight hundred gallons of wine from an acre, is considered a great yield; but our native scuppernong yields more than double this quantity. At the rate of more than two thousand gallons per acre, was the yield of the late Capt. *Burlingham's* scuppernong vineyard, near Louisburg, Franklin county. And, I understand that the produce of the same, now, is enormous.

So long as I have experimented with this vine (about eight years) I am sanguine, from its most abundant yield this season and heretofore, in the expectation of about two thousand gallons to the acre. And by the superior way of making scuppernong wine, by adding to the must doubly refined sugar, it is carried from my door at 30 dollars a barrel; and no prospect of any limit to the demand.

Another grape, a native fall superior vine of this county, and called for want of another name, "*Halifax*," bids fair to out-do the scuppernong even, in yield and other excellencies. Cultivated like the scuppernong by my peculiar mode for all vines, viz: that of trimming or keeping clear of all laterals during the season of growing, and suffering to go full length, or unchecked; at first, on stakes, and eventually, on scaffolding, this vine (the Halifax) has yielded at the rate of six hundred gallons the acre, at the third year's cultivation, and nearly double this, the fourth year's growth, after planting with a root. It is, moreover, a large grape, excellent for table use. It makes a most excellent *white* wine by one process, and a *red* wine by another, pronounced by good judges similar to Madeira. It has been affected by no casualities of vines with me.

The past hard winters killed or injured none of this kind. They have never failed to bear abundantly, and the first has never rotted.

Considering the favorable nature of our climate, and other inducements, it is my intention to connect the vine and silk culture in the same establishment. My opinion coincides with that of others consulted, on whose judgment, in such matters, I place much confidence, that the press of employment in either business will come at different times of the year, and not interfere with each other. And that therefore, the same hands can be employed at both, and have ample and lucrative employment, the year round. I consider it a laudable ambition to afford constant, profitable labor to widows and children and superannuated persons, or to those in a dependent situation, and, at the same time, make, clear of all outlays 500 dollars annually per acre by the *silk*, and 1000 dollars by the *vine culture*.

Such ambition ought to be viewed as still more worthy a genuine and enlightened patriot, when, so far as crowned with success, it helps to relieve our country of an annual foreign drain of millions for wine and silk. In regard to this tendency of the vine and silk culture, the legislative premium in Massachusetts of two dollars a pound for all silk manufactured in the state, ought to be looked upon with the eye of patriotism as wisely munificent.

Most respectfully, yours, &c.

SIDNEY WELLER.

From the Roanoke Advocate.

ON THE MORUS MULTICAULIS AND ITS ADAPTATION TO SOUTHERN CLIMES.

* * * * * * * That the multicaulis is one of the most delightful ornamental trees of moderate size, and most pleasant by its brilliant

green foliage for the eye to rest upon, is conceded by all who have beheld it. But its greatest excellence consists in its vast superiority for the silk culture. Adherence to brevity forbids me here to enumerate and enlarge upon these advantages. *Two* only I will here mention. The one that it abridges the labor of gathering the leaves for the silk worms at least ten fold, by reason of its leaf being more than that proportion larger than the Italian mulberry, formerly considered best for the silk culture. The other is its rapidity of growth, as well as ease of propagation. Three or four years are necessary for the Italian mulberry to grow before using the leaves to advantage. But the multicaulis can be used even the first season of growth, by leaving a few of the upper leaves only. But its great facility of propagation, and its especial adaptation to our climate, are the facts I would particularly advert to now. And to do this, I will state my own experiments with this plant. These experiments relate only to the propagation and growth of the trees; for I have not yet entered upon the silk culture, nor will I, till the pressing demand for the trees ceases, which will probably be some years yet, notwithstanding they are propagated with the ease and rapidity to exceed every thing in the vegetable kingdom with which I am acquainted.

As a proof of which, I will state, that last spring I cut a number of the branches into pieces about an inch long, with single buds on each, and drilled them as I would corn—drills three feet apart and about a foot in the drill. With the simple trouble of keeping the ground clean and loose, they grew five, six, and more feet high, and sold in common with some others, raised from cuttings of greater length, for twenty and twenty-five dollars per hundred.

The cultivation of this tree yields at present more profit than any other appropriation of ground by honest industry, some gold mines not excepted, for the profit is great from the *surface* without any *deep digging*. I have made for two years in succession a hundred dollars off of less than a half quarter of an acre.

I delivered, for cash, lately at Gaston, trees carried by a single horse vehicle, and raised on much less than an acre, to the amount of two hundred and seventy-five dollars. Four years ago, last April, I procured from Baltimore a single plant of the morus multicaulis about a foot long, at the price of a dollar, besides the cost of conveyance with grape vines and other articles. From this invested capital of a *single* dollar, I have sold to the amount of about a thousand dollars, and have a stock now on hand worth, in the market, several hundred dollars. I was the first I believe that propagated this tree in North Carolinia. I have ascertained that the plant grows several feet higher in a season, with us, than northerly, say in the latitude of Baltimore; that here it endures the severest winters without injury; whereas in northerly regions, it is much subject to having its top part destroyed in winter. And it has been found that plants procured here or from me, do better for propagating from, than those procured from northern nurseries. A gentleman in Virginia, who purchased about two hundred dollars worth from me a year ago, apprised me that those from me did better than those he got from the north. This gentleman visited most of the mulberry and silk establishments in the union last summer to ascertain by personal investigation the profits of the silk culture. He returned so thoroughly convinced of its advantages, that he engaged hands for the silk business, and commenced preparing buildings, and the like forthwith to begin the culture next spring. He visited me a short time since to see my establishment, and to procure trees for himself and a friend to propagate from, (his own of former growth he last concluded to devote to the silk business the coming season.) On seeing my nurseries of the morus multicaulis, (my first trees being sixteen and eighteen feet high, and the younger ones of corresponding growth,) he assured me that they far surpassed any he had seen elsewhere.

I will conclude, Mr. Editor, with a declaration that may appear as visionary to some as if I had expressed a hope four years ago, that a small tree of *a dollar's*, would, ere long, realize *a thousand*—the declaration is this; that, such is my confidence from experiment, in North Carolina soil and climate in regard to the vine and silk culture, that, from the former, with native grapes, such as the scuppernong and Halifax, and my "American system" of vine culture, I calculate to clear annually a *thousand* dollars per acre; and from the latter or silk business, *five hundred;* and at the same by combining the two employments, afford throughout the year, lucrative labor, for widows and children, and superannuated persons, many of whom are now, for the want of such employment, a burden to the community.

In haste, yours, and with all due respect,

SIDNEY WELLER.

Brinkleyville, N. C., November 30, 1837.

Extracts from (Loudon's) Gardener's Magazine, of December.

KYANIZING WOOD.

A very important point which we have to notice under this head, is the process of kyanizing, or tanning, every kind of wood to be used for garden purposes, by immersing it in a solution of corrosive sublimate. It is not easy to convince practical men of the value of this preparation; nevertheless it is placed beyond all doubt, both by theory and experiment. We refer to what is stated on the subject, in p. 365; and we may also direct attention to several papers in the '*Architectural Magazine*,' for the present year, [1837,] and one by Charles Waterton, esq., in his '*Essays on Natural History*,' just published. One caution we think it necessary to give to those who intend making use of this process, which is to shape and fit the wood to be kyanized exactly for the purpose for which it is intended, before submitting it to the process. This will appear the more necessary, when it is considered that the kyanizing, or tanning process, penetrates only a few lines into the surface of the wood: in close-grained wood, for example, such as the beech, not more than a quarter of an inch; and in looser-grained woods, such as common deal, very seldom more than half an inch. If, therefore, a gardener were to kyanize tallies for naming plants, or sticks for tying them up, before sharpening the ends to be inserted in the ground, and were to sharpen these ends afterwards, the rot would commence below, just as soon as if the process of kyanizing had not been employed. We are particularly anxious

to impress this on the minds of gardeners; because, in consequence of some persons having an idea that the corrosive sublimate penetrates to the very heart of the wood immersed in it, they have it kyanized first, and sawn up into the forms in which they mean to use it afterwards. Assuredly, the wood so treated, if in pieces thicker than an inch, will not be rendered one whit more durable by the process, than if it had never been submitted to it. On the other hand, by preparing the wood first, and kyanizing it afterwards, not only a prolonged durability is obtained, but the expense of painting rendered unnecessary, unless for ornament. The process of kyanizing is calculated to give much greater durability to espaliers for fruit trees; to hot-bed frames and sashes of every description; to all kinds of trellis-work; to rods and stakes of every kind for tying up plants; to tallies, large and small, for naming plants; to mats and canvass for covering them; to packthread and strands of bass mat for tying them; to baskets for carrying them; and to hurdles of reeds or straw for protection; and in short, to every thing made of wood, or vegetable fibre, used in the formation or culture of a garden. It would thus be a great benefit to the proprietors of gardens and pleasure-grounds, if they could overcome their prejudicies so far as to give it a trial.

From the same.

FOREIGN TIMBER TREES IN BRITAIN.

Some years ago, through the exertions of Mr. Lawson, the eminent seedsman of Edinburgh, many thousands *Pìnus Cémbra*, raised from seeds imported from Switzerland, were planted in different parts of Scotland; and, what is remakable, though this tree, in the climate of London, seldom makes shoots above six inches or eight inches in a year, in the neighborhood of Edinburgh it has made shoots from one foot to two feet annually. A great many larches, raised from seeds received from the Tyrol (see '*Highland Society Transactions*,' vol. xi. p. 391,) by Mr. Lawson, have also been planted in Scotland; and the plants, we are informed, show a deeper green in the foliage than that of plants raised from British seeds. The black pine of Austria, also introduced by Mr. Lawson, has been planted to a considerable extent; more especially by Sir John Nasmyth, at New Posso, in Peeblesshire. Among the most useful exertions that have been made in arboriculture for the last year, and during some years previously, are those of Messrs. Grigor, nurserymen at Elgin and Forres; who stimulated by the rewards offered by the Highland Society, have been the means of disseminating many thousand plants of the true Highland pine, by far the most valuable timber tree indigenous or in cultivation in Europe, next to the larch and the oak. It may be worthy of remark, that, of all the ultra-European trees which have been cultivated, in Britain, for such a time as to admit of forming an estimate of the value of their timber, there is not one the timber of which is equal to that of the trees indigenous to Europe. The only shadow of an exception is the *pópulus monilifera*, which is a very doubtful native of America, and much more likely, in our opinion, to be an improved European tree. The oaks of America, beautiful as they are, are worth little as timber, either in America or Europe, when compared with the British oak; with the exception of the live oak, which will not attain a timber size in Britain. No American pine or fir, that will attain the size of a forest tree in this country, has wood equalling that of the Scotch pine, the larch, or the spruce. We might, in like manner, go through all the genera of American trees; but we have said enough, we trust to impress the reader with an idea of the importance of cultivating for timber, and on a large scale, the improved varieties of European species. Not that we wish to discourage the planting of ultra-European trees on a large scale also; because there may be some of these that will prove far more valuable in this country than we have any idea of; and, also, because they add to the variety and beauty of our general scenery, and may, at some future time, give rise to improved kinds by cross-breeding.

From the same.

INJURIOUS EFFECTS OF THE ODOR OF LAUREL LEAVES ON PLANTS.

Having read, in the '*Gardener's Magazine*,' an account of a method of destroying the different insects that infest plants, taken from a paper read before the Horticultural Society, I was induced to give it a trial, as the means stated were so simple. I accordingly procured a quantity of laurel leaves; and, having well bruised them, spread them in the evening on the floor of a small stove. On the following day, at noon, I was surprised to see all the young leaves of some vines under the rafters appear as though scorched; and upon further examination, I found many of the stove plants affected in the same manner: the euphorbias, in a few days, lost nearly all their leaves, and gesnerias, gloxinias, &c., though they did not lose their leaves, yet presented a very unsightly appearance. I immediately concluded that this was caused by the odor of the laurel leaves, and instantly swept them all out of the house; but, to be sure of the matter, I took a plant of pelargonium and placed it under a hand-glass, with a quantity of the bruised laurel leaves, and on the following morning it presented precisely the same appearance as the plants in the stove; which satisfied me of the injurious effects of the laurel leaves upon vegetation; though, at the same time, they were incapable of destroying the mealy bug, which was the insect I was chiefly annoyed with. I send you this account, that you may, if you think fit, publish it as a contradiction to the assertion, that the odor of laurel leaves will not injure plants; and thus prevent other gardeners from falling into the same error that I have done.

J. H. A.

Bromley, Kent, October 25, 1837.

From the same.

TRANSPORTING PLANTS AND SEEDS FROM ABROAD.

The following extracts are from the instructions relative to this subject given by M. Mirbel to the expedition in the *Astrolabe*—"Formerly, in long voyages, it was very difficult to preserve plants alive for any length of time. During the voyage, they were liable to perish from many circumstances; and, upon their arrival, it was necessary

to pay a heavy duty, without any drawback. Now, however, by a sure and simple process, seeds and plants may be brought from the most distant countries, with the certainty of the greater number of them arriving safe. The mode recommended by the English gardener, Luschnath (?) is this: He places in the bottom of a strong watertight box a layer of clay reduced to a proper moist and soft consistency; and above this young ligneous plants with the leaves stripped off, laid horizontally side by side. He next spreads above these plants another layer of clay, similar to the first; and beats it well with a large wooden mallet, for the purpose of expelling the water and superfluous air, leaving to the plants only just as much space as they can fill. He continues to spread alternately a layer of plants and a layer of clay, until the box is quite full, taking care to beat properly every layer of clay; and, finally, the box is hermetically closed."

M. Fischer, director of the Imperial Botanic Garden at St. Petersburgh, writes thus, in 1836—"some ligneous plants, packed according to the method of Luschnach (?), which have been sent from Rio Janeiro to St. Petersburgh, have arrived there for the most part alive, after a voyage of more than five months; and others, which were packed in the ordinary manner, died."

This method is also applicable to seeds. They should be placed in layers between strata of clay, and kept at such a distance from each other, that, should any of them germinate during the voyage, which is not unfrequent, they might not injure one another. By this method, seeds, and a great many species of trees and shrubs, which are known to lose their germinative property in a short time, may be brought safely to Europe, and thrive there if properly treated. In the same box both seeds and plants may be packed at one time.

From the Horticultural Transactions.

EVERY BUD HAS ROOTS.

Every bud, when it shoots sends down roots under the bark, as a seed does in the soil. "The Pterocarpus marsupium, one of the most beautiful of the large trees of the East Indies, and which grows in the greatest perfection about Malacca, affording by its elegant wide-expanding boughs, and thick, spreading, pinnated leaves, a shade equally delightful with that of the far-famed tamarind tree, is readily propagated by cuttings of all sizes, even if planted after the pieces have been cut for many months, and appear quite dry, and fit only for the fire. I have witnessed some, of from 3 inches to 7 inches in diameter, and 10ft. or 12 ft. long, come to be fine trees in a few years. While watching the transformation of the log into the tree, I have been able to trace the progress of the radicles from the buds, which began to shoot from the upper part of the stump a few days after it had been placed in the ground, and marked their progress till they reached the earth. By elevating the bark, minute fibres are seen to descend contemporaneously as the bud shoots into a branch. In a few weeks, these are seen to interlace each other. In less than too years, the living fibrous system is complete; and, in five years, no vestige of its log origin can be perceived. Its diameter and height are doubled, and the tree is, in all respects, as elegant and beautiful as if it had been produced from seed. These details are introduced, because I think they afford a clear explanation of the process of nature, which, with so little assistance, converts branches into trees, and will help to unfold those subsequent steps, by which the same process is so modified, that, instead of a full-formed beautiful tree, the bough is tortured into a grotesque dwarf."

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